CHAPTER 56

LIST OF EFFECTIVE TEMPORARY REVISIONS

FOLLOWING IS A COMPLETE LISTING OF ALL ACTIVE TEMPORARY REVISIONS (TR'S). TR'S NOT LISTED SHOULD BE REMOVED. THE ATA NUMBER, CONFIG CODE AND PAGE NUMBER IDENTIFIES THE PAGE PRECEDING THE TR.

TR NUMBER	ATA NUMBER	CONFIG CODE	PAGE NUMBER	TR DATE

NONE

CHAPTER 56

WINDOWS

LIST OF EFFECTIVE PAGES

CHAPTER/SECTION	PAGE	DATE	CONFIG CODE
List of Effective Pages	1	Dec 15/94	
	2	Dec 15/94	
Table of Contents	1	Nov 15/83	
	2	Nov 15/83	
	3	Nov 15/83	
	4	Nov 15/87	
56-conts	1/2	Nov 15/83	
56-DIAGM	1/2	May 15/82	
56-INDEX	1/2	May 15/82	
56-00-00	1	May 15/82	
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56-10-00	1	Nov 15/87	
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56-10-01	201	Aug 15/76	
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R 56-10-01	416	Dec 15/94	
R 56-10-01	417/418	Dec 15/94	
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56-10-01	602	May 15/82	
56-10-01	603	May 15/85	
56-10-01	604	Jul 15/84	
56-10-01	605	Jul 15/84	
56-10-01	606	Jul 15/84	
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56-10-01	608	Jul 15/84	
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56-10-01	701	Nov 15/82	
56-10-01	702	Nov 15/84	
56-10-01	703	Nov 15/84	
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56-21-02	401	Aug 15/81					
56-21-02	402	Jan 15/72					
56-21-02	403	Jan 15/72					
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CHAPTER 56

WINDOWS

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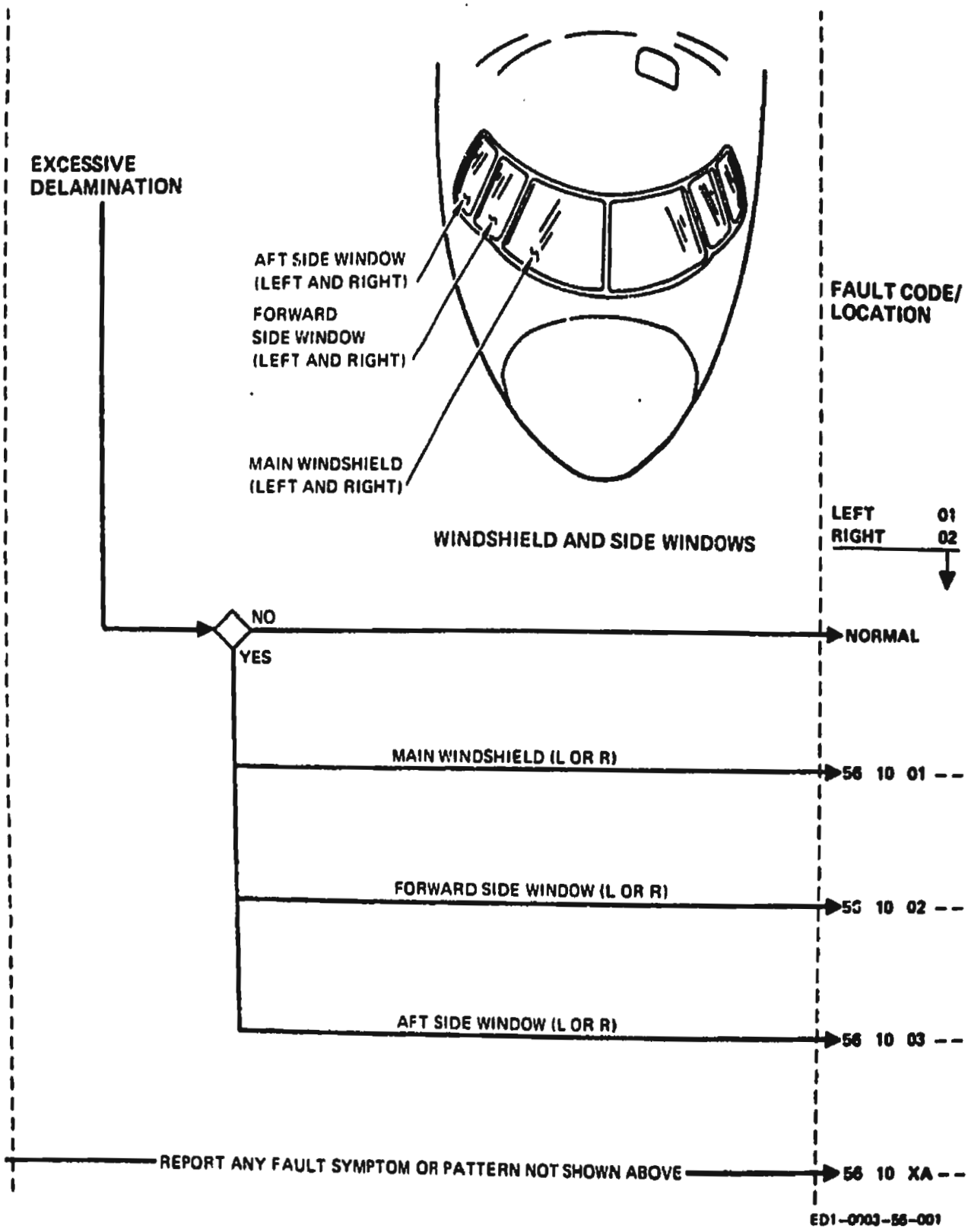

EXCESSIVE DELAMINATION
AFT SIDE WINDOW (LEFT AND RIGHT)
FORWARD SIDE WINDOW (LEFT AND RIGHT)
MAIN WINDSHIELD (LEFT AND RIGHT)
WINDSHIELD AND SIDE WINDOWS
FAULT CODE/ LOCATION
LEFT 01
RIGHT 02
NO
YES
NORMAL
MAIN WINDSHIELD (L OR R)
56 10 01 - -
FORWARD SIDE WINDOW (L OR R)
56 10 02 - -
AFT SIDE WINDOW (L OR R)
56 10 03 - -
REPORT ANY FAULT SYMPTOM OR PATTERN NOT SHOWN ABOVE
56 10 XA - -
ED1-0103-56-001

R Windshield Delamination - Fault Codes
Figure 1

EFFECTIVITY: ALL

56-FAULT CODE DIAGRAM

FAULT CODE INDEX
TABLE 1

FAULT CODE	1. LOG BOOK REPORT 2. FAULT ISOLATION REFERENCE
56 10 XA __	1. A Windshield Delamination fault was encountered by the crew which is not covered in the fault code diagram. (Ref. Fault Code diagram for flight crew actions.) 2. 56-10-01 Page Block 201 Paragraph 4B
R 56 10 01 __ R	1. (01=LEFT, 02=RIGHT) main windshield excessively delaminated. 2. 56-10-01 Page Block 201 Paragraph 4B
R 56 10 02 __ R	1. (01=LEFT, 02=RIGHT) forward side window excessively delaminated. 2. 56-10-01 Page Block 201 Paragraph 4B
R 56 10 03 __ R	1. (01=LEFT, 02=RIGHT) aft side window excessively delaminated. 2. 56-10-01 Page Block 201 Paragraph 4B

WINDOWS - DESCRIPTION AND OPERATION

1. General

Four types of windows are installed on the aircraft (Ref. Fig. 1).

Flight station windows (windshields)

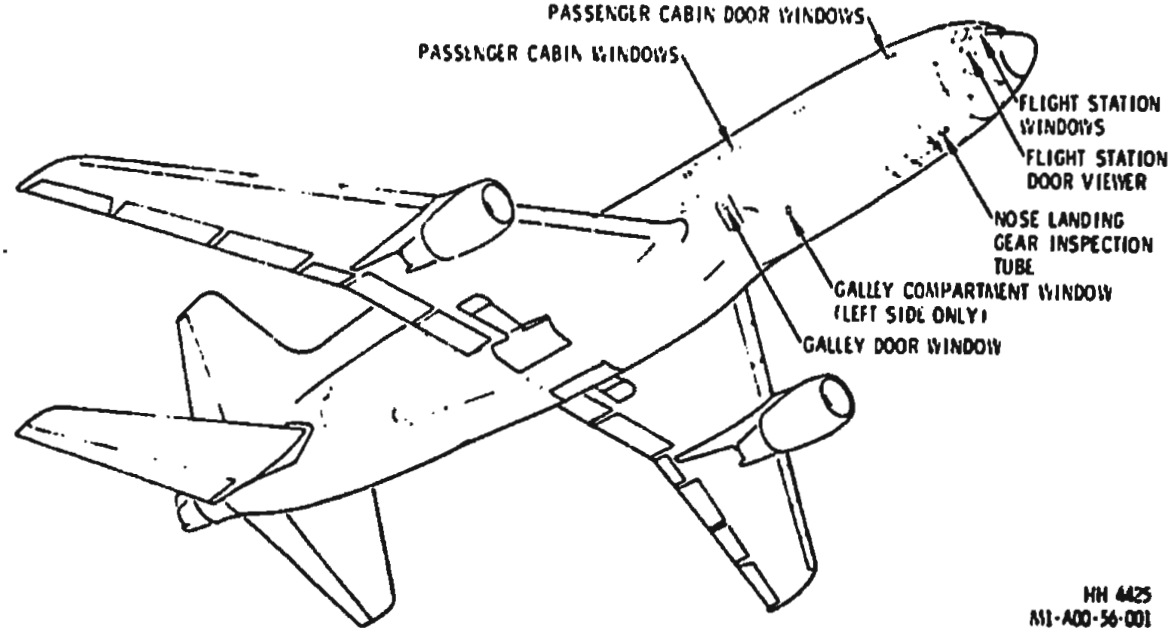
Cabin windows

Door windows

Inspection and observation windows

The flight station windows consist of six windshield assemblies: Two main forward, two side forward, and two side aft. The windshield assemblies are removable from outside the aircraft without disturbing the glareshield, instrument panel, or trim.

All windshields have a curved contour to widen the field of vision, to lessen drag, and to provide greater resistance to bird impact. The main windshields are heated to prevent icing



R Windows
R Figure 1

(anti-icing), and the side windshields are heated to prevent fogging.

R Cabin windows of common design are in the passenger compartment. A cabin window is also located in the galley compartment. The window assemblies consist of two separate panes of stretched acrylic plastic. The panes are mounted in one-piece molded rubber seals. The window assemblies are retained in the fuselage window frames by spring retainers.

Windows are installed in all passenger compartment doors. A window is also installed in the galley compartment door.

The windows in the passenger compartment doors have a prism installation which deflects the view angle 30 degrees downward to make ground observation in an emergency landing situation possible.

The window in the galley compartment door is a conventional two-pane, stretched-acrylic window.

Inspection and observation windows are installed in various places where they can be used for alternate verification of important functions or for special decision-making situations.

The following inspection devices and observation windows are used:

Inspection tube for nose landing gear locking

Optical viewer (peephole) in flight station door

Window in door to electrical service center

Optical viewers in floor access panels to cargo compartments.

Optical viewers in floor access panels to galley compartment.

FLIGHT STATION - DESCRIPTION AND OPERATION

1. General

Each of the six flight station windshield and side window assemblies consists of a transparent assembly, the retainer frame, and assembly hardware (Ref. Fig. 1).

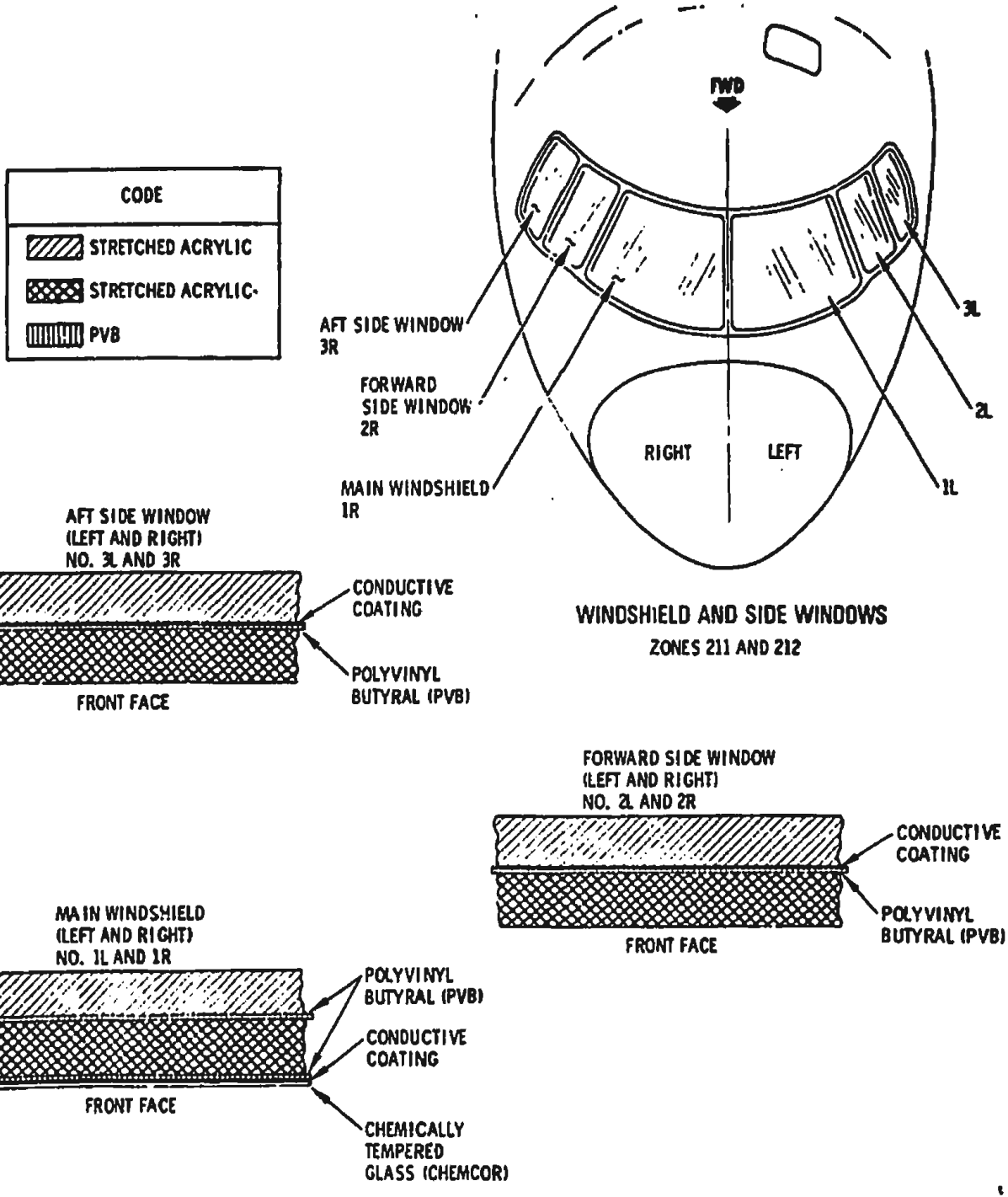
The main windshield transparent assembly (Ref. Fig. 2) is a five-ply laminated assembly of an outer scratch-resistant abrasion shield of tempered (chemcor) glass, a polyvinyl interlayer, an outer pane of stretched acrylic, a second polyvinyl interlayer, and an inner pane of stretched acrylic. The polyvinyl interlayers allow for thermal differentials, improve crack-propagation resistance, and provide greater impact strength. A scratch-resistant hard coat is applied to the inner side of the acrylic panel.

The windshield retainer frame, made of machined aluminum, is attached to the transparent assembly with seals, gaskets, bushings, and hardware.

An electrically heated conductive coating is applied to the inner surface of the glass abrasion shield to prevent icing. Braided bus conductors, imbedded between the glass abrasion shield and the first vinyl interlayer, extend along upper and lower edges of the conductive coating to provide heating power input. Three temperature sensors are positioned between the laminations at the upper aft corner of the windshield panels. The conductor braid and sensor terminals extend inboard through the laminations. The main windshields have an anti-static
R coating on the outer glass surface.

The side windows (Ref. Fig. 3 and 4) are three-ply laminated assemblies. The transparent assemblies consist of an outer stretched acrylic pane, a polyvinyl interlayer, and an inner pane of stretched acrylic. The polyvinyl interlayer allows for temperature differentials, improves crack-propagation resistance, and provides greater impact strength.

Defogging of main windshield and side windows is accomplished by an electrically heated conductive coating applied to the outside surface of the inner acrylic pane. Braided bus conductors, imbedded between the inner pane and the vinyl interlayer, extend along the forward and aft edges of the conductive coating to provide heating power input. Three temperature sensors are located between the laminations at the aft upper corner of the windshields and side windows. The bus conductor and sensor terminals extend through the laminations.

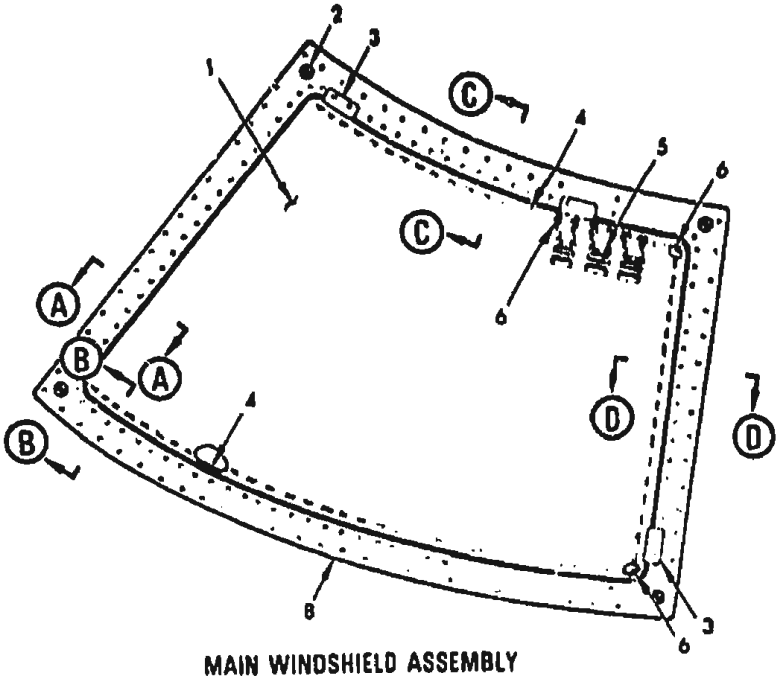


WINDSHIELD AND SIDE WINDOWS
ZONES 211 AND 212

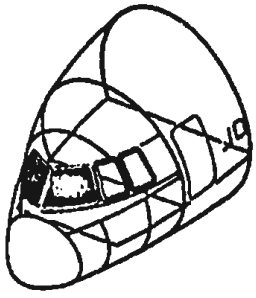
WINDSHIELD AND SIDE WINDOW TYPICAL CROSS SECTION

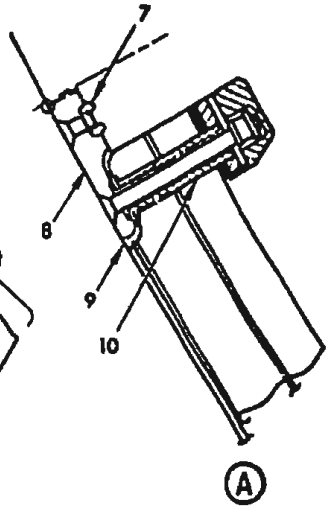
M1-0000-56-027

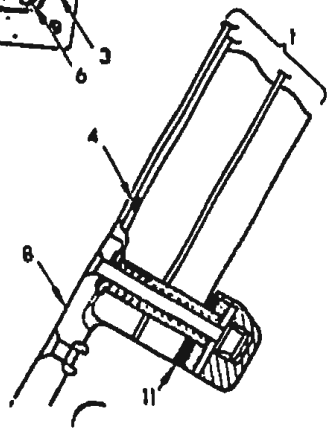
CR Flight Station Windshields and Side Windows
CR Figure 1

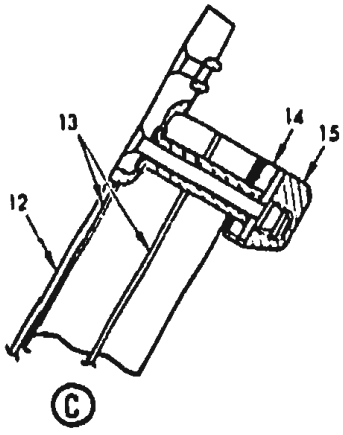


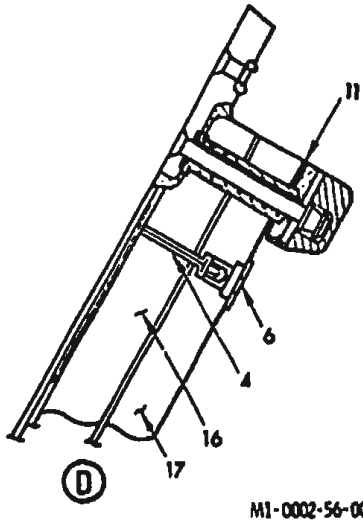
MAIN WINDSHIELD ASSEMBLY











1 TRANSPARENT ASSEMBLY
2 HOIST POINT (TYP 4 PLACES)
3 STATIC DISCHARGE CLIP /1\ (TYP 3 PLACES)
4 BRAID
5 SENSOR
6 TERMINAL
7 SEAL
8 RETAINER ASSEMBLY
9 SEALANT
10 BUSHING
11 TAPE
12 GLASS ABRASION SHIELD
13 INTERLAYER (POLYVINYL)
14 GASKET
15 TRIM
16 OUTER PANE
17 INNER PANE

NOTE

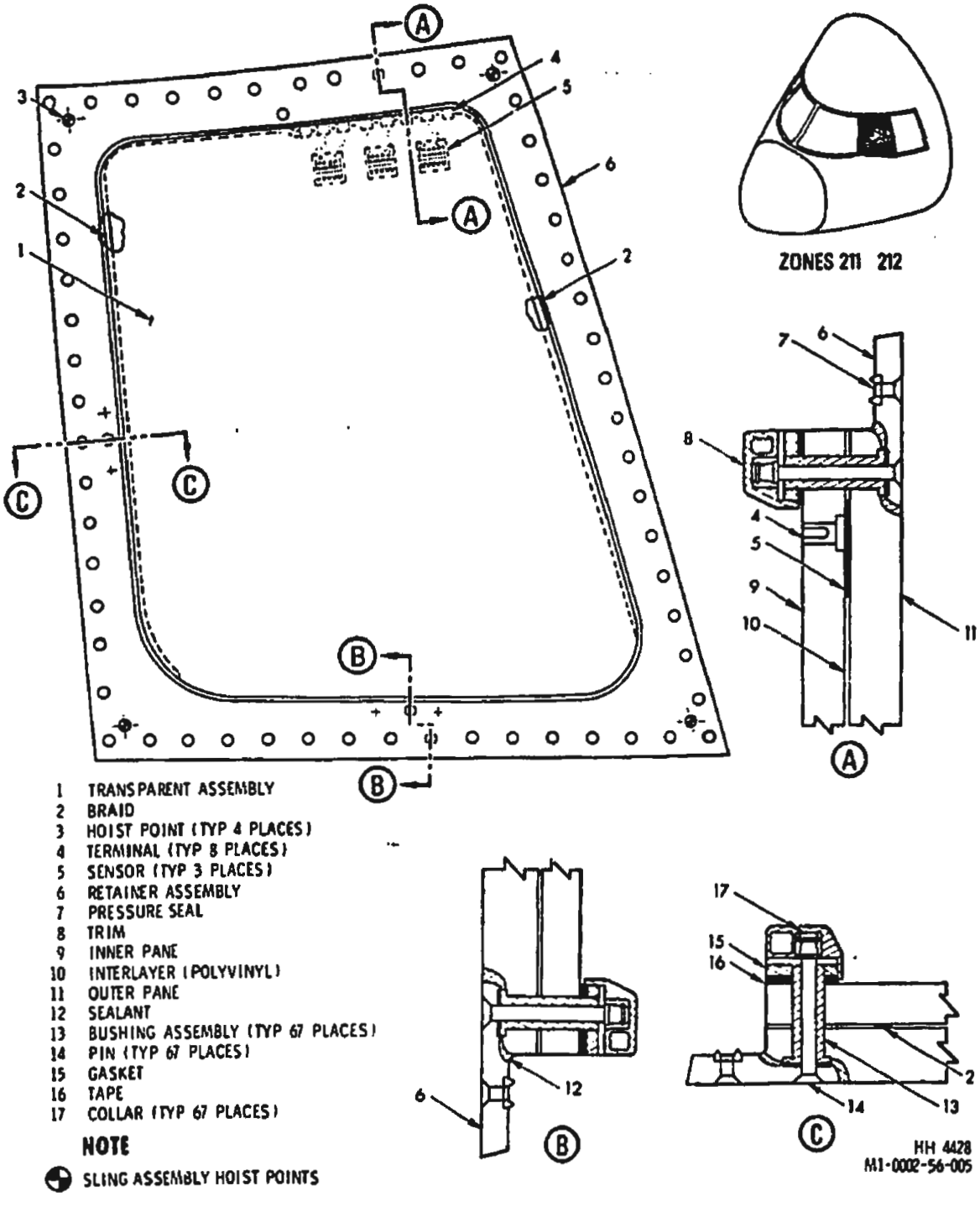
GSE HOIST POINTS

/1\ STATIC DISCHARGE CLIPS INSTALLED ON EARLY DASH NUMBER 1503046-XXX WINDSHIELDS ONLY.

M1-0002-56-003

R Main Windshield
R Figure 2

EFFECTIVITY: ALL



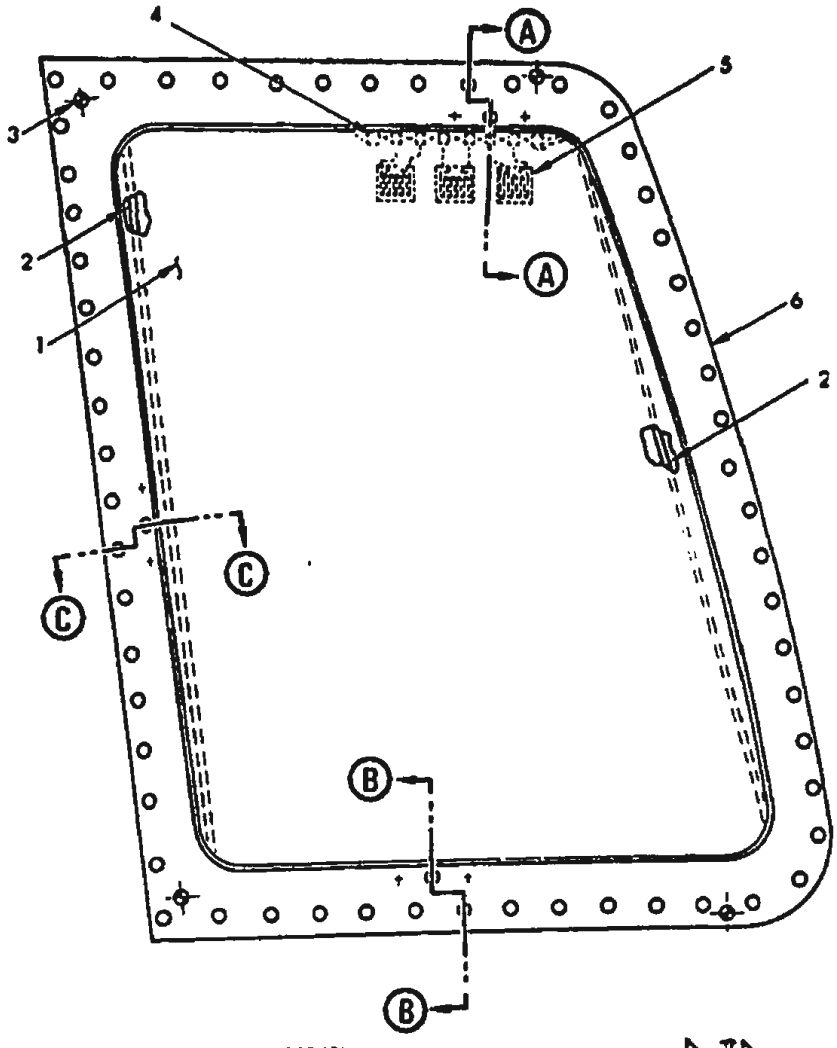
1 TRANSPARENT ASSEMBLY
2 BRAID
3 HOIST POINT (TYP 4 PLACES)
4 TERMINAL (TYP 8 PLACES)
5 SENSOR (TYP 3 PLACES)
6 RETAINER ASSEMBLY
7 PRESSURE SEAL
8 TRIM
9 INNER PANE
10 INTERLAYER (POLYVINYL)
11 OUTER PANE
12 SEALANT
13 BUSHING ASSEMBLY (TYP 67 PLACES)
14 PIN (TYP 67 PLACES)
15 GASKET
16 TAPE
17 COLLAR (TYP 67 PLACES)

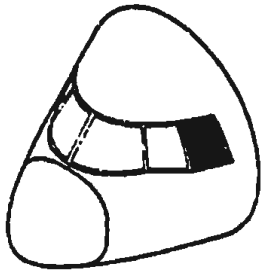
NOTE

SLING ASSEMBLY HOIST POINTS

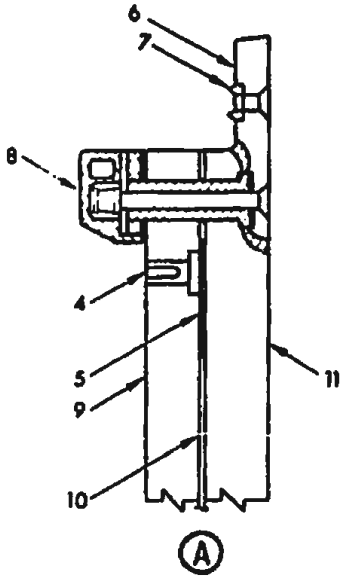
R
R

Forward Side Windshield
Figure 3

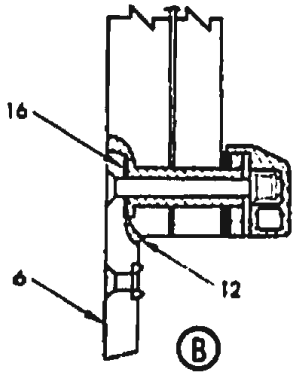


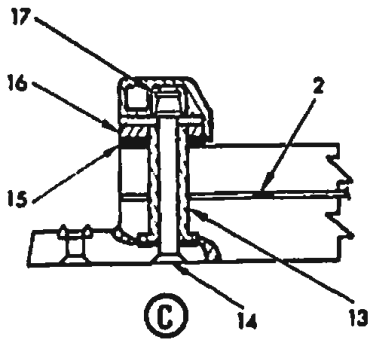


ZONES 211 212



1 TRANSPARENT ASSEMBLY
2 BRAID
3 HOIST POINT (TYP 4 PLACES)
4 TERMINAL (TYP 8 PLACES)
5 SENSOR (TYP 3 PLACES)
6 RETAINER ASSEMBLY
7 PRESSURE SEAL
8 TRIM
9 INNER PANE
10 INTERLAYER (POLYVINYL)
11 OUTER PANE
12 SEALANT
13 BUSHING ASSEMBLY (TYP 73 PLACES)
14 PIN (TYP 73 PLACES)
15 TAPE
16 GASKET
17 COLLAR (TYP 73 PLACES)





NOTE
SLING ASSEMBLY HOIST POINTS

HH 4427
M1-0002-56-004

Aft Side Windshield
Figure 4

R

WINDSHIELDS - MAINTENANCE PRACTICES

R 1. General

R Either one of the two forward main windshield panels may have
R certain types of damage and/or abnormal conditions which are
R acceptable, provided that specified action is taken. The
R information provided herein applies to the damaged/abnormal
R conditions, as follows:

R (1) Forward Main Panel Heat Inoperative (Glass Unbroken)

R (2) Damaged (Broken/Shattered) Chemcor Glass

R (3) Damaged Polyvinyl Butyral (PVB) Interlayer

R The procedures which follow treat each of the three conditions
R separately.

R NOTE: Figure 201 (Sheets 1 and 2) provide details of windshield
R construction. Review these figures prior to performing
R any work outlined in this procedure.

R A definite attempt should be made to leave the PVB
R Interlayer undisturbed, if acceptable visibility exists
R after removal of the Chemcor glass. The PVB Interlayer
R provides protection to the acrylic plastic outer main
R panel surface, thus making it possible to rebuild a
R damaged windshield panel. If the PVB Interlayer must be
R removed to obtain acceptable visibility, the possibility
R of rebuilding is reduced.

R 2. Equipment and Materials

R Ball Peen Hammer

R Safety glasses or goggles

R Gloves

R Two heat lamps (500 Watt)

R Thermometer (to read to 150°F)

R Sharp knife or equivalent

R Wedges (wood or plastic)

Tape, Commercial, 3M, Y-435 (8 Mil thick X 1-1/2 to 2 inches wide)

3. Referenced Procedures

30-41-00 Windshield Temperature Control and Defogging System - Maintenance Practices

56-10-01 Windshield - Cleaning and Painting

4. Deactivation

A. Forward Main Panel Heat Inoperative (Glass Unbroken)

NOTE: This procedure applies to a windshield panel that has satisfactory optical qualities.

(1) On Flight Engineer/Second Officer overhead circuit breaker panel (CB2), zone 215, open and collar circuit breaker (B15 for left panel, B18 for right panel) for applicable temperature control system.

R (2) Install placard in a prominent position on the left or
R right main instrument panel, CAPTAINS (or FIRST
R OFFICERS) WINDSHIELD HEAT INOPERATIVE.

R (3) Make appropriate entry in aircraft log book.

NOTE: If the optical qualities are unsatisfactory, due to excessive delamination, the Chemcor glass must be broken and removed. Refer to procedure outlined in Paragraph 4B.

B. Damaged (Broken/Shattered) Chemcor Glass

WARNING: SAFETY GLASSES OR GOGGLES AND GLOVES MUST BE WORN WHEN BREAKING AND REMOVING CHEMCOR GLASS LAYER.

NOTE: When it is necessary to remove the Chemcor layer and/or vinyl (PVB inter layer) under adverse high temperature conditions, the glass surface must be cooled by a water spray or use of wet blankets before attempting to remove the glass layer or vinyl interlayer.

(1) On Flight Engineer/Second Officer overhead circuit breaker panel (CB2), zone 215, open and collar circuit breaker (B15 for left panel, B18 for right panel) for applicable temperature control system.

(2) Using ball peen hammer, strike glass surface several times, or until entire glass area is shattered. Use minimum force to obtain shattered pattern.

(3) Remove all glass possible by use of high pressure water jet.

CAUTION: USE CARE TO AVOID DAMAGE TO SURFACE OF PVB INTERLAYER.

(4) Remove any remaining glass around zee strip with wood or plastic wedge.

(5) Determine whether optical qualities of the windshield panel are satisfactory.

(a) If optical qualities are satisfactory, apply strip of tape along lower sill only to cover step between windshield frame and PVB interlayer surface (Ref. Fig. 201, View E).

CAUTION: IF POSSIBLE, AVOID USING WINDSHIELD WIPER ON PVB INTERLAYER SURFACE. IF WINDSHIELD WIPER USE IS DEEMED NECESSARY, ASSURE THAT PVB INTERLAYER SURFACE IS WET TO PREVENT DAMAGE WHICH COULD RESULT IN REDUCED VISIBILITY.

NOTE: The application of tape is the same when applied to either the acrylic pane or the PVB interlayer. Application of tape will make it possible to use the windshield wiper, if required.

(b) If the optical qualities are unsatisfactory, the PVB interlayer must be removed or the damaged windshield replaced. For information on removal of PVB interlayer refer to Paragraph 4C.

R (6) Install the following placards in a prominent position
R on the left or right main instrument panel:

R CAPTAINS (or FIRST OFFICERS) WINDSHIELD HEAT
R INOPERATIVE.

R CHEMCOR OUTER LAYER (and VINYL INTERLAYER) REMOVED FROM
R CAPTAINS (or FIRST OFFICERS) WINDSHIELD. IF WINDSHIELD
R WIPER USE IS MANDATORY, ASSURE THAT WINDSHIELD SURFACE
R IS WET TO PREVENT FURTHER DAMAGE AND REDUCED
R VISIBILITY.

R (7) Make appropriate entry in aircraft log book.

C. Damaged Polyvinyl Butyral (PVB) Interlayer

(1) On Flight Engineer/Second Officer overhead circuit breaker panel (CB2), zone 215, open and collar circuit breaker (B15 for left panel, B18 for right panel) for applicable temperature control system.

CAUTION: TO PREVENT DAMAGE TO SURFACE OF OUTER ACRYLIC PANE, EXTREME CARE MUST BE EXERCISED WHEN MAKING CUT THROUGH PVB INTERLAYER. KNIFE PENETRATION INTO ACRYLIC SURFACE WILL CAUSE IRREPARABLE DAMAGE.

NOTE: The windshield assemblies will have PVB interlayer thickness of either 0.075 inch (3 sheets) or 0.100 inch (4 sheets). The PVB interlayer sheets are bonded into an integral layer except for approximately a one inch width around the periphery. In this area, two thin mylar strips (approximately one inch wide) are inserted between sheets, as shown in Figure 201. This feature facilitates cutting through the PVB interlayer. When the knife has cut through the second separator strip, there is only one thickness of PVB sheet (0.025 inch) which remains. Use extreme care when cutting through the last sheet to prevent damage to acrylic pane.

(2) Remove sealant from upper inboard corner of windshield panel, in area where initial cut will be made through PVB interlayer sheets and separator strips.

(3) Using sharp knife, or equivalent, cut through PVB interlayer (Ref. Fig. 201).

NOTE: The length of the cut in the corner area shall not be greater than required to raise interlayer (with wedge) enough to be able to grasp raised edge with pliers.

(4) Using wood or plastic wedge, carefully raise edge of PVB interlayer. Grasp raised edge with pliers and exert a steady, diagonal, outward and downward pull, cutting through PVB interlayer (on each side) and along a straight line immediately inboard of sealant. As the PVB interlayer is peeled off of the acrylic pane, sensor wires and bus-bar braid will become exposed. This wiring should be cut as required.

NOTE: At temperatures below 70°F, the peeling of PVB Interlayer may be expedited by use of heat lamps

to warm the area. However, the surface temperature should not exceed 110°F. A thermometer should be attached with putty to the outside surface of the interlayer and just ahead of the lamps. Lamps should be a minimum of 18 inches from PVB interlayer surface.

(5) After PVB interlayer has been removed, check acrylic pane surface for any evidence of glass and/or dust particles. If required, use low pressure spray from water hose to wash away foreign material.

CAUTION: IF WINDSHIELD WIPER USE IS DEEMED NECESSARY, ASSURE THAT ACRYLIC PANE SURFACE IS WET TO PREVENT DAMAGE WHICH COULD RESULT IN REDUCED VISIBILITY.

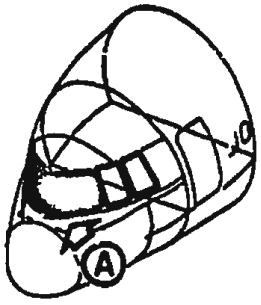
NOTE: For additional information on cleaning of acrylic surfaces, refer to 56-10-01, Cleaning and Painting.

(6) Apply strip of tape, along lower sill area only, to cover step between windshield frame and acrylic pane surface (Ref. Fig. 201, View E).

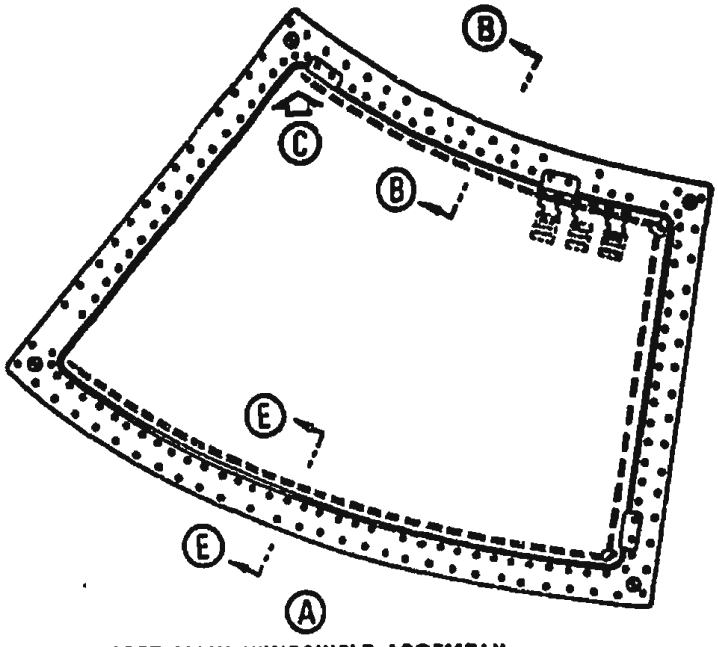
NOTE: Application of the tape will make windshield wiper operation possible, if required.

(7) Placard appropriate windshield wiper control "IF WINDSHIELD WIPER USE IS DEEMED NECESSARY, ASSURE THAT WINDSHIELD SURFACE IS WET".

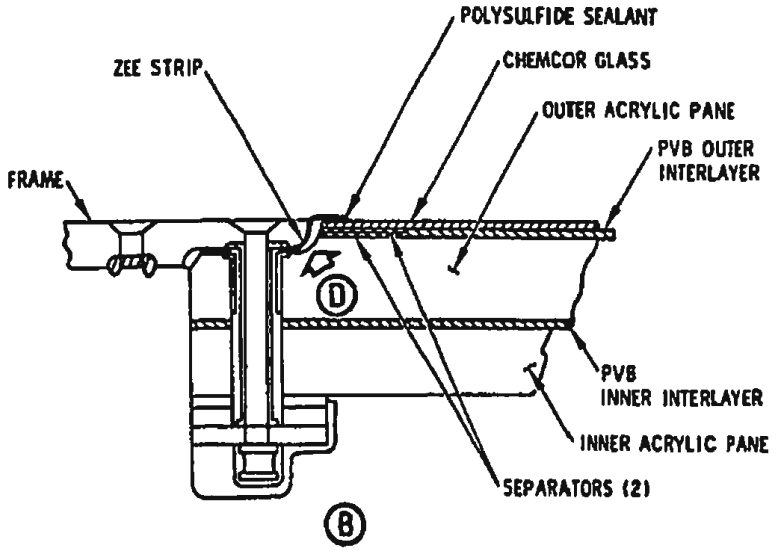
(8) Make appropriate entry in aircraft log book.

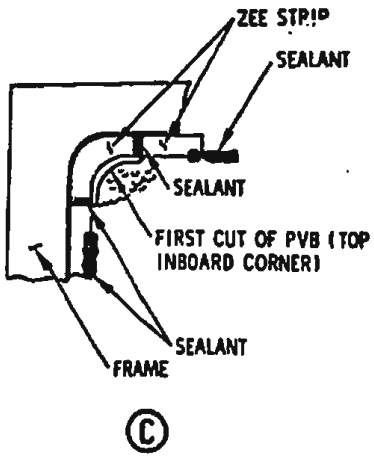


ZONES 211, 212



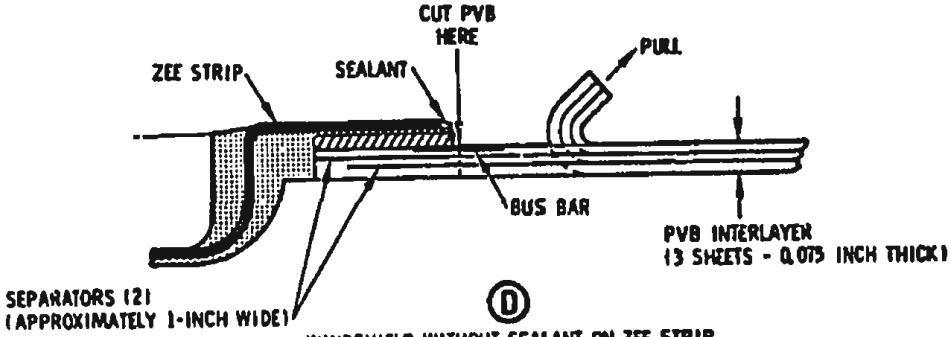
LEFT MAIN WINDSHIELD ASSEMBLY
RIGHT OPPOSITE



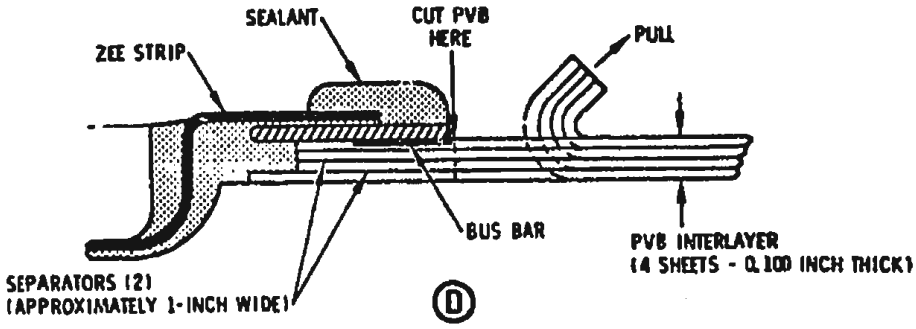


M1-0100-56-021

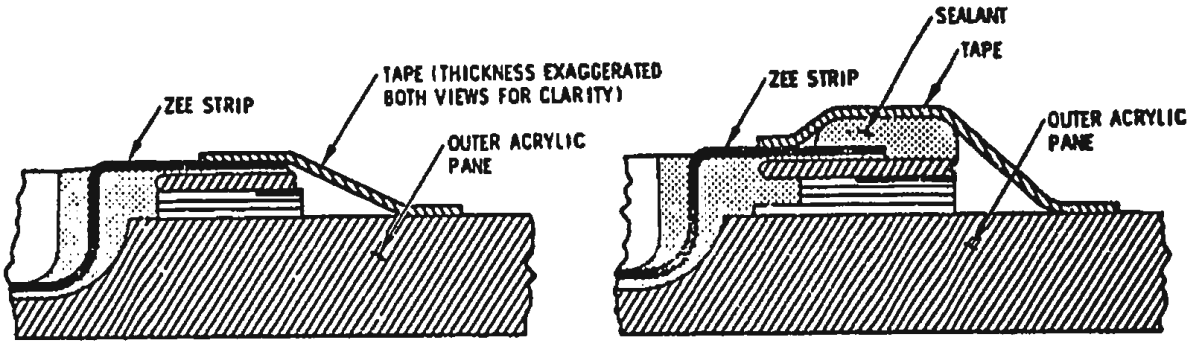
Removal of Main Windshield Broken Glass and PVB Interlayer
Figure 201 (Sheet 1)



Ⓓ WINDSHIELD WITHOUT SEALANT ON ZEE STRIP AND WITH THREE PVB SHEETS



Ⓓ WINDSHIELD WITH SEALANT ON ZEE STRIP AND WITH FOUR PVB SHEETS



Ⓔ APPLICATION OF TAPE - LOWER SILL AREA ONLY (WINDSHIELDS WITHOUT SEALANT ON ZEE STRIP)

Ⓔ APPLICATION OF TAPE - LOWER SILL AREA ONLY (WINDSHIELDS WITH SEALANT ON ZEE STRIP)

M1-0100-56-022

Removal of Main Windshield Broken Glass and PVB Interlayer
Figure 201 (Sheet 2)

WINDSHIELDS - REMOVAL AND INSTALLATION

1. General

C A. Dispatch with No. 1 Windshield Heat Inoperative

C (1) It is now permissible to dispatch an aircraft with one
C No. 1 windshield heat system inoperative provided the
C following conditions are satisfied:

C (a) All packs are operative.

C (b) Aircraft is not operated in icing conditions.

C (c) Temperature of departure and arrival airports is
C 50°F or higher.

C (d) Defogging fan is operative.

C B. The windshield removal and installation procedure is applicable for all windshields: left and right main windshields, left and right forward side windshields, and left and right aft side windshields.

2. Equipment and Materials

Windshield Sling Assembly, B-693, or equivalent

C Foam rubber, approximately one inch thick

Floor crane and sling with lift capacity of approximately 200 pounds and 30-foot reach

Protective material: Manila paper, clear plastic sheet, or cardboard, and heavy adhesive tape

3. Referenced Procedure

56-10-01 Windshields - Cleaning

4. Removal/Installation

R CAUTION: BEFORE REMOVING OR INSTALLING COUNTERSUNK HEAD
R WINDSHIELD ATTACH BOLTS, CHECK THAT SCREWDRIVER BIT IS IN GOOD CONDITION. BE CAREFUL TO HOLD BIT
R PERPENDICULAR TO SURFACE OF BOLT HEAD. USE SPECIAL CARE TO PREVENT BIT, WINDSHIELD SLING ASSEMBLY, OR ANY OTHER TOOL OR EQUIPMENT FROM CONTACTING EDGE OR SURFACE OF GLASS.

A. Removal

(1) On Flight Engineer/Second Officers overhead circuit breaker panel CB-2, zone 215, open and tag circuit breakers:

LEFT WINDOW HEAT - SIDE WINDOWS - FWD PWR

LEFT WINDOW HEAT - SIDE WINDOWS - AFT PWR

LEFT WINDOW HEAT - SIDE WINDOWS - CONT

LEFT WINDOW HEAT - WINDSHIELD - CONT

LEFT WINDOW HEAT - WINDSHIELD - PWR

RIGHT WINDOW HEAT - WINDSHIELD - CONT

RIGHT WINDOW HEAT - WINDSHIELD - PWR

RIGHT WINDOW HEAT - SIDE WINDOWS - CONT

RIGHT WINDOW HEAT - SIDE WINDOWS - FWD PWR

RIGHT WINDOW HEAT - SIDE WINDOWS - AFT PWR

WINDSHIELD DEFOG & F/O WIPER PWR

WINDSHIELD WASHER - CONT

WINDSHIELD WASHER - PUMP

WARNING: MAXIMUM OUTPUT VOLTAGE OF HEATING TRANSFORMER IS 115 to 200 VOLTS.

C CAUTION: A PAD MUST BE PLACED OVER A WINDSHIELD WHENEVER
C THE OPPOSITE SIDE WINDSHIELD IS BEING REPLACED. A
C PAD MUST BE PLACED OVER BOTH WINDSHIELDS WHENEVER
C OTHER MAINTENANCE IS BEING PERFORMED IN THE
C VICINITY OF THE WINDSHIELDS. THE PAD CAN BE HELD
C IN PLACE WITH TAPE ATTACHED TO THE WINDSHIELD
C FLANGE OR FUSELAGE. THE PAD IS MADE OF 1 INCH
C THICK FOAM RUBBER AND CUT TO THE SAME SHAPE AS THE
C WINDSHIELD.

(2) Disconnect (and identify for reinstallation) electrical power leads and sensor leads from terminals of windshield (Ref. Fig. 401) to be removed.

R CAUTION: OUTER (CHEMCOR) GLASS PLY ON MAIN WINDSHIELDS WILL SHATTER IF NICKED OR CHIPPED. USE EXTREME CARE WHEN WORKING AROUND WINDSHIELDS.

(3) Attach protective material to exterior and interior surfaces of windshields. Tape material to metal frame of windshield assembly being removed, and to the windshield on either side of the one being removed. Apply an extra layer of tape over the edge of windshield glass.

(4) When removing main windshield, position windshield wiper on sill structure below windshield assembly.

CAUTION: DO NOT APPLY EXCESSIVE PRESSURE ON WINDSHIELD ATTACHMENT SCREWS WHEN REMOVING SCREWS.

(5) Remove all windshield frame attachment screws at sides of windshield, and leave at least four attach screws at top and bottom of windshield frame. The four screws should be approximately equally spaced.

R (6) Remove screws from windshield sling attach points (Ref.
R Fig. 402). Install stabilizing pads at sling hoist points.

(7) Adjust two lower spreader bars on the windshield sling assembly as follows:

(a) Unlock locking knob.

(b) Adjust length of spreader bars, using adjusting knobs until four stabilizing pads are aligned with spreader bar attachment holes.

(8) Attach lower spreader bars to stabilizing pads with quick-disconnect pins.

(9) Turn stabilizing pad lock knob until slack is removed from lower spreader bars.

(10) Attach webbing and swivel assemblies to the upper spreader bars as identified for applicable windshield.

(11) Attach webbing snap fastener ends to lower spreader bar eyebolts.

(12) Attach hoist cable hook to upper spreader bar eyebolt. Adjust web slides to within 2 inches of swivel rollers.

(13) Remove remaining windshield attach screws.

CAUTION: DO NOT BEND OR TWIST WINDSHIELD.

(14) Use windshield pushout jacks at ends of lower spreader bar, as required, to separate windshield from aircraft. Turn jacks in small increments and in progressive sequence.

(15) Remove windshield and aerodynamic seals for reinstallation.

B. Installation

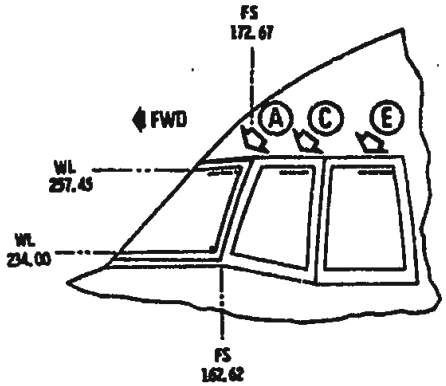
CAUTION: DO NOT REMOVE PROTECTIVE PAPER FROM WINDSHIELD UNTIL WINDSHIELD HAS BEEN INSTALLED. GLASS IS EXTREMELY NOTCH SENSITIVE. THE SLIGHTEST NICK OR CHIP WILL SHATTER THE OUTER GLASS PLY ON MAIN WINDSHIELDS.

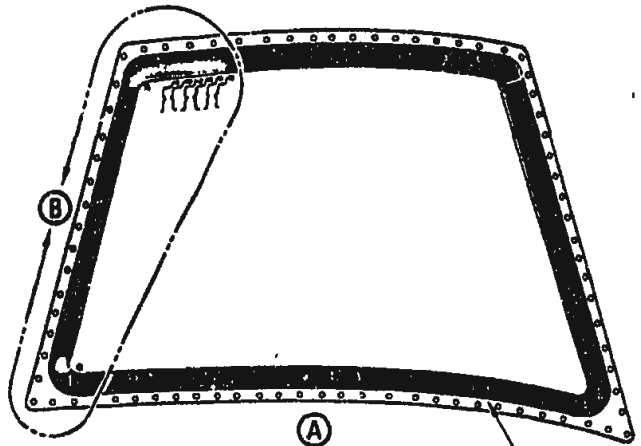
(1) If protective material is not on the windshield, tape protective material on inner and outer sides of windshield for scratch protection.

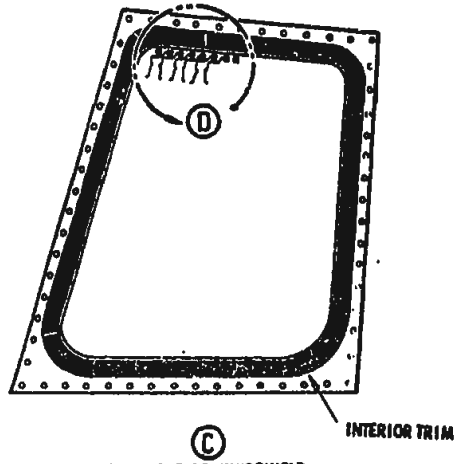
NOTE: If new windshield is being installed, be sure that the protective paper or plastic on the inside face of the windshield is peeled back sufficiently to clear the attaching structure. If this protective coating is not displaced sufficiently to clear the attaching areas, it is exceedingly difficult to remove after attachment and damage to the windshield may be incurred.

(2) Inspect windshield and mounting frame structure for cleanness and smooth surface.

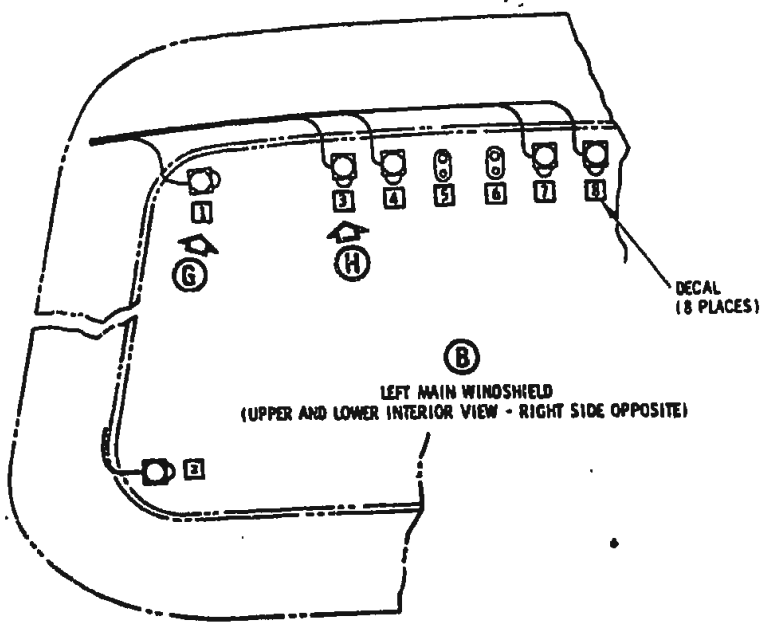
(3) Check that windshield pressure seal is properly installed and glued into seal groove on inboard side of retainer assembly, and that all seal holes are aligned with retainer holes.

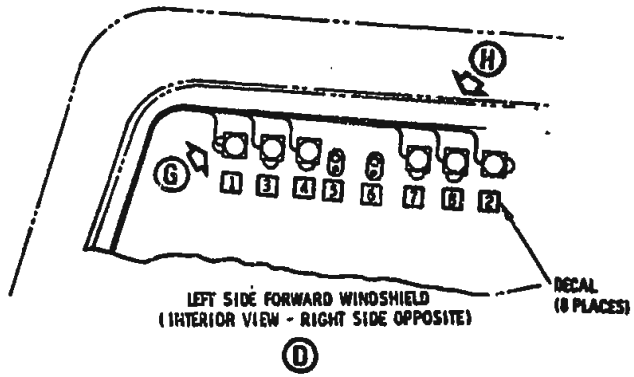






TERMINALS
- 1 HEATER
- 3 OVERHEAT SENSOR
- 4 OVERHEAT SENSOR
- 5 SPARE SENSOR
- 6 SPARE SENSOR
- 7 NORMAL SENSOR
- 8 NORMAL SENSOR
- 2 HEATER



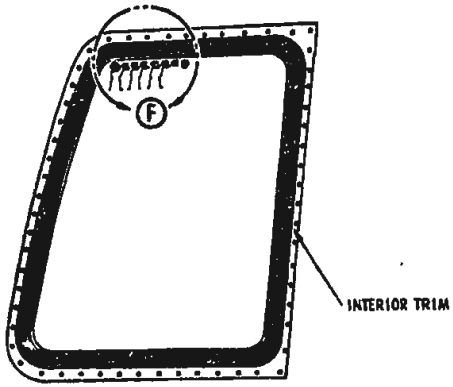


M1-0000-56-004

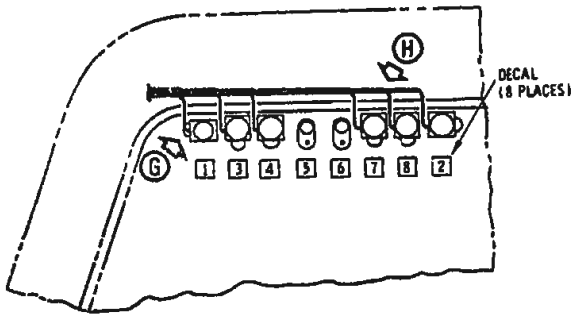
CR Windshield Electrical Connections
CR Figure 401 (Sheet 1)

EFFECTIVITY: ALL

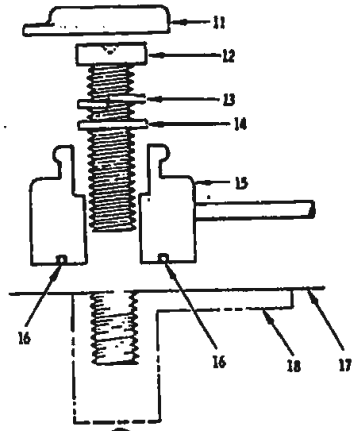
001B



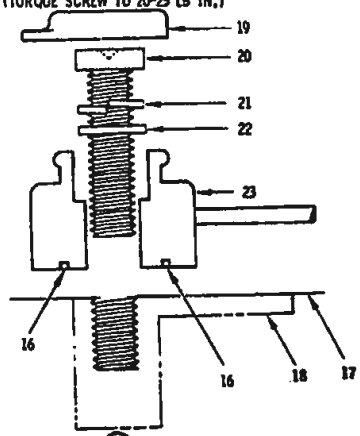
E
AFT SIDE WINDSHIELD
(INTERIOR VIEW LOOKING OUTWARD)
FWD



F
LEFT SIDE AFT WINDSHIELD
(INTERIOR VIEW - RIGHT SIDE OPPOSITE)
FWD



G
HEATER TERMINAL INSTALLATION
TYPICAL TERMINALS [1] AND [2]
(TORQUE SCREW TO 20-25 LB IN.)



H
SENSOR TERMINAL INSTALLATION
TYPICAL TERMINALS [3] THROUGH [8]
(TORQUE SCREW TO 10-12 LB IN.)

TERMINALS
- [1] HEATER
- [3] OVERHEAT SENSOR
- [4] OVERHEAT SENSOR
- [5] SPARE SENSOR
- [6] SPARE SENSOR
- [7] NORMAL SENSOR
- [8] NORMAL SENSOR
- [2] HEATER

11 COVER (RED)
12 SCREW (NAS540BU-10)
13 LOCKWASHER (MS35338-43)
14 WASHER (NAS620C-10)
15 TERMINAL BLOCK (WB0630)
16 O-RING
17 INSIDE SURFACE OF WINDSHIELD
18 WINDSHIELD TERMINAL INSERT
19 COVER (GRAY)
20 SCREW (NAS540BU-10)
21 LOCKWASHER (MS35338-42)
22 WASHER (NAS620C-8)
23 TERMINAL BLOCK (WB0620)

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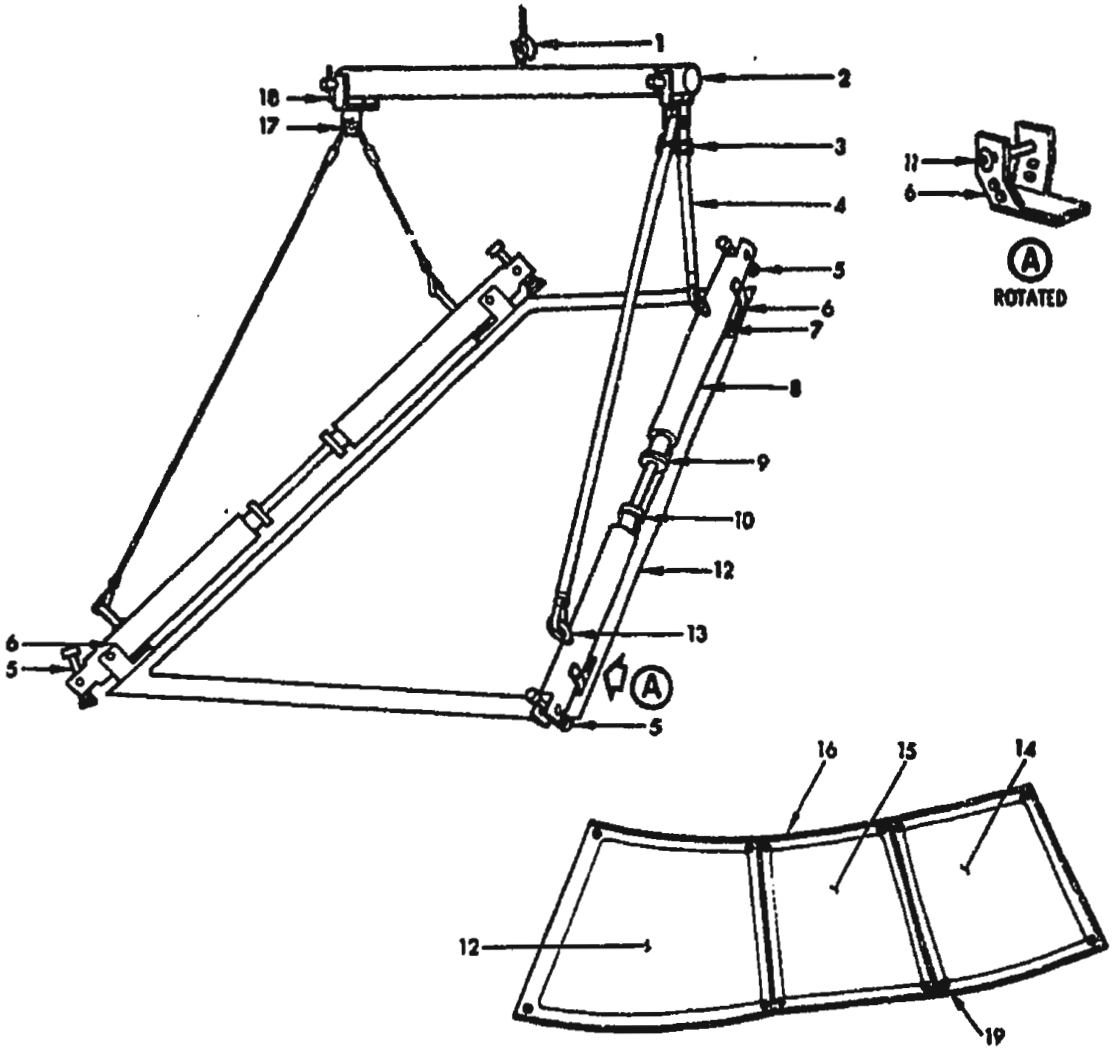
CR
CR

Windshield Electrical Connections
Figure 401 (Sheet 2)

EFFECTIVITY: ALL

001B



1	HOIST CABLE	7	STABILIZING PAD LOCK KNOB (4)	13	EYEBOLT (4)
2	UPPER SPREADER BAR	8	LOWER SPREADER BAR	14	WINDSHIELD - SIDE AFT
3	WEBBING SLIDES	9	ADJUSTING KNOB	15	WINDSHIELD - SIDE FORWARD
4	WEBBING	10	LOCKING KNOB	16	AERODYNAMIC SEAL (TYP)
5	WINDSHIELD PUSHOUT JACK (4)	11	QUICK-DISCONNECT PIN	17	SWIVEL ROLLER (2)
6	STABILIZING PAD (4)	12	WINDSHIELD - MAIN LEFT	18	SWIVEL ASSEMBLY (2)
				19	SLING ASSEMBLY ATTACH POINTS (4 PLACES EACH WINDSHIELD)

HH 6182
M1-0003-56-009

R
R

Windshield Sling Assembly
Figure 402

WARNING: MAXIMUM OUTPUT VOLTAGE OF HEATING TRANSFORMER IS 115 TO 200 VOLTS.

(4) Verify that circuit breakers opened in Step 4A(1) are open and tagged, and that wires are accessible when windshield is in place.

(5) Attach sling assembly (Steps 4A(6) through 4A(12)).

R (6) Position windshield in opening provided by fuselage
R structure by adjusting support webbing straps.

R (7) Maximum gap that may exist between contact faces of
R windshield retainer and windshield support surround
R structure at any point around retainer is 0.25 inch
R before attach bolts are installed and torqued (Ref.
R Fig. 403, View B). If gaps are difficult to measure
R because windshield can be rocked back and forth within
R fuselage opening, measure gaps as follows:

R (a) Rock windshield hard over against one edge of
R windshield support surround structure.

R (b) Measure maximum resulting gap at opposite edge
R between windshield retainer and windshield support
R surround structure. Gap must not exceed 1.00 inch
R (Ref. Fig. 403, View C).

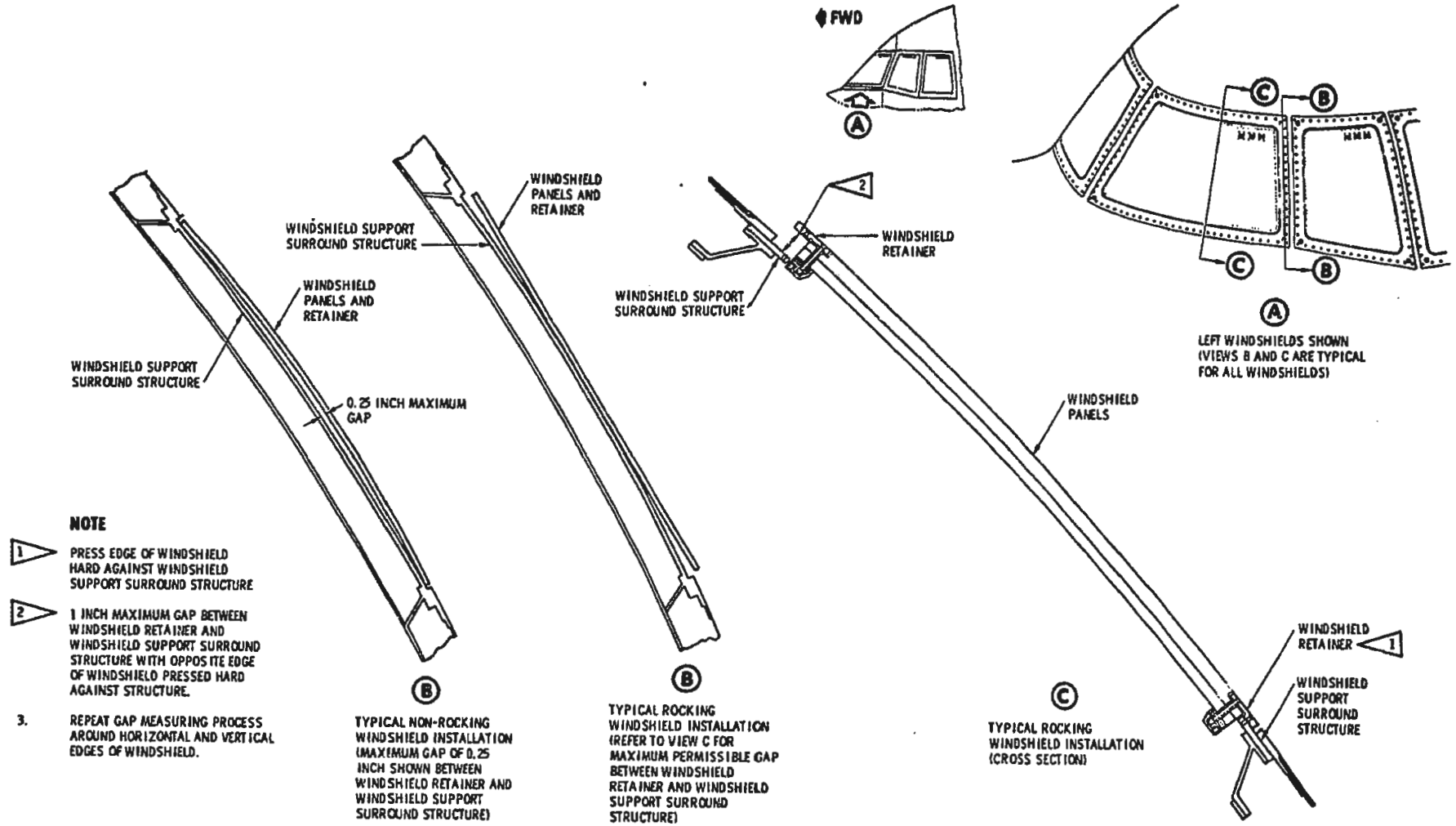
R (c) Repeat Steps 4B(7)(a) and 4B(7)(b) at various
R locations on horizontal and vertical edges of
R windshield.

R (8) Align windshield with mounting structure and holes.

CAUTION: DO NOT USE POWER TOOLS TO START ATTACHMENT SCREWS, OR USE EXCESSIVE FORCE ON SCREWS WHILE TURNING SCREWS IN. DO NOT DAMAGE OR PUSH OUT MOLDED PRESSURE SEAL IN RETAINER GROOVE WHILE INSERTING SCREWS. USE EXTREME CARE, THE SLIGHTEST NICK OR CHIP WILL SHATTER THE OUTER GLASS PLY ON MAIN WINDSHIELDS.

NOTE: On aircraft 001-006,
to prevent or reduce windshield attach bolt galling and seizing, replace NAS 4304U19 titanium bolts with NAS 4204U19 stainless steel bolts.

R (9) To align windshield retainer attach bolt holes with holes in support structure flange, install two phenolic spacer blocks (approximately 0.25 by 0.75 by 10.00 inch) at lower edge of windshield retainer. These blocks can be used as leverage to align attach bolt


FWD
A
B
C
LEFT WINDSHIELDS SHOWN (VIEWS B AND C ARE TYPICAL FOR ALL WINDSHIELDS)
WINDSHIELD SUPPORT SURROUND STRUCTURE
WINDSHIELD PANELS AND RETAINER
0.25 INCH MAXIMUM GAP
TYPICAL NON-ROCKING WINDSHIELD INSTALLATION (MAXIMUM GAP OF 0.25 INCH SHOWN BETWEEN WINDSHIELD RETAINER AND WINDSHIELD SUPPORT SURROUND STRUCTURE)
WINDSHIELD RETAINER
TYPICAL ROCKING WINDSHIELD INSTALLATION (REFER TO VIEW C FOR MAXIMUM PERMISSIBLE GAP BETWEEN WINDSHIELD RETAINER AND WINDSHIELD SUPPORT SURROUND STRUCTURE)
WINDSHIELD PANELS
TYPICAL ROCKING WINDSHIELD INSTALLATION (CROSS SECTION)
WINDSHIELD SUPPORT SURROUND STRUCTURE

NOTE

1. PRESS EDGE OF WINDSHIELD HARD AGAINST WINDSHIELD SUPPORT SURROUND STRUCTURE
2. 1 INCH MAXIMUM GAP BETWEEN WINDSHIELD RETAINER AND WINDSHIELD SUPPORT SURROUND STRUCTURE WITH OPPOSITE EDGE OF WINDSHIELD PRESSED HARD AGAINST STRUCTURE.
3. REPEAT GAP MEASURING PROCESS AROUND HORIZONTAL AND VERTICAL EDGES OF WINDSHIELD.

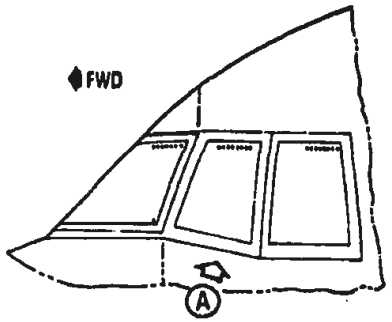
M1-0000-56-038

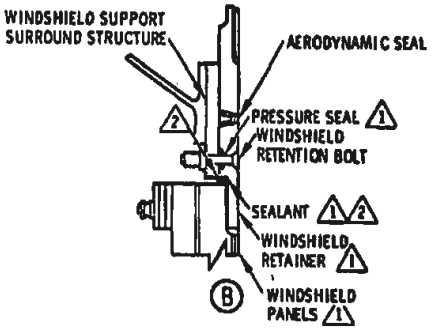
R
R

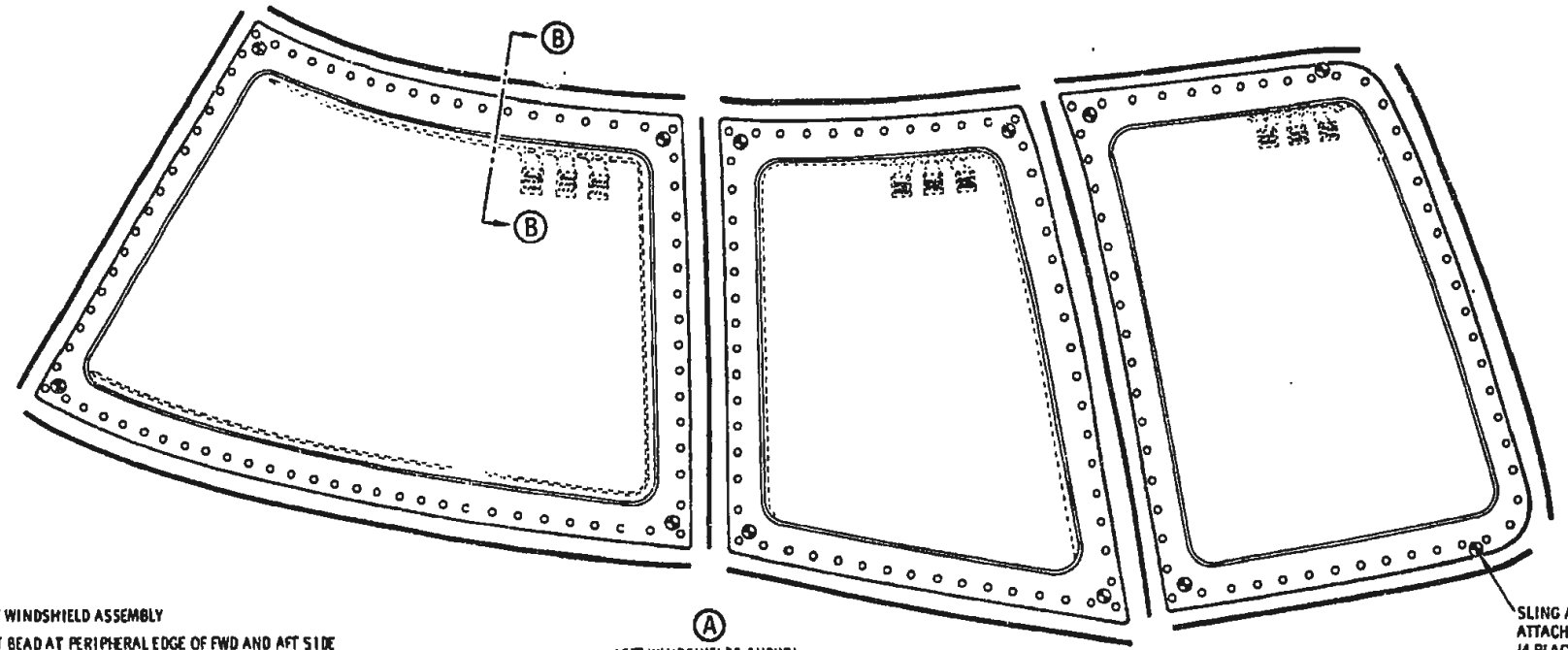
Windshield Contour Deviation Check
Figure 403

EFFECTIVITY: ALL

001B







NOTE:

1. PART OF WINDSHIELD ASSEMBLY
2. SEALANT BEAD AT PERIPHERAL EDGE OF FWD AND AFT SIDE WINDSHIELDS MAY PREVENT PROPER SEATING OF PRESSURE SEAL. THIS CONDITION MAY BE ELIMINATED BY CHAMFERING THE OUTBOARD EDGE OF THE WINDSHIELD SUPPORT SURROUND STRUCTURE (REF. SB 56-011)

(A) LEFT WINDSHIELDS SHOWN (TYPICAL RIGHT SIDE)

M1-0002-56-016

Windshield - Removal and Installation
Figure 404

holes and establish equal width gap around the windshield for installation of the aerodynamic seal (Ref. Fig. 404).

(10) Install and hand tighten attach bolts 3 to 4 turns. Windshield may be pushed inward by hand pressure to permit bolt thread engagement. Use care to avoid damaging or displacing pressure seal.

(11) Hand tighten one attach bolt in upper, lower, and sides of retainer. Remove spacer blocks and hand tighten all bolts, skipping around the retainer as necessary to draw the windshield evenly into its installed position.

(12) Remove sling assembly and stabilizer pads.

(13) Torque all attach bolts to approximately 60 lb in. in the following order.

(a) Center bolt at top of windshield.

(b) Center bolt at bottom.

(c) Center bolt at each side.

(d) Bolts to either side of tightened bolt at top.

(e) Repeat Step 4B(13)(d) at bottom and sides.

(f) Continue tightening the fasteners to eigher side of the tightened bolts until all bolts are torqued.

(14) Remove sling assembly and reinstall screws to seal holes at hoist points.

(15) Using bolt tightening sequence in Step 4B(13) apply final torque of 70 to 80 lb in. to all bolts.

(16) Replace damaged plate nuts (if necessary) as follows:

(a) Remove interior trim around windshield.

(b) Remove nut retention clip.

(c) Install new plate nut.

(d) Reinstall clip.

(e) Reinstall interior trim.

(17) Install aerodynamic seals as follows:

CAUTION: DO NOT STRETCH THE SEAL EXCEPT AS NOTED.

(a) Set aerodynamic seal flanges into groove and push into place by hand, or tap with rubber mallet. A slight stretching in combination with mallet tapping is necessary where the gap is of minimum dimension. Do not end a horizontal seal at junction of horizontal and vertical seal strip. Trim or add seal as required. All seal butt ends must be tight and have good side retention.

CAUTION: VERIFY THAT O-RING IS SECURELY INSTALLED IN TERMINAL BLOCK (REF. FIG. 401).

DO NOT INTERCHANGE NAS5403U12 POWER TERMINAL SCREW (NO. 1, NO. 2) WITH NAS5402U10 SENSOR TERMINAL SCREW (NO. 3, 4, 7, 8).

BE SURE THAT SCREW ENGAGES THE TERMINAL IN THE WINDSHIELD STRAIGHT TO AVOID CROSS-THREADING.

CHECK FOR THE TIGHTNESS OF THE TERMINAL BLOCK AFTER INSTALLATION OF THE PROPERLY TORQUED SCREW.

(18) Connect sensor terminal blocks to windshield terminals (Ref. Fig. 401) using fasteners shown in Figure 401. Position terminal blocks and torque screws to 10 to 12 lb in.

R CAUTION: INSPECT HEATER TERMINAL BLOCKS AND WINDSHIELD
R TERMINALS PRIOR TO CONNECTION. ABSOLUTE MINIMUM
R ELECTRICAL RESISTANCE IS REQUIRED TO PREVENT
R THERMAL DAMAGE TO WINDSHIELD WHEN WINDSHIELD HEAT
R IS APPLIED.

(19) Connect heater terminal blocks to windshield terminals using fasteners (Ref. Fig. 401). Position terminal blocks and torque screws 20 to 25 lb in.

(20) Install terminal block caps.

(21) Remove tags and close circuit breakers opened in Step 4A(1).

(22) Remove protective material from windshield.

(23) Clean windshield (Ref. 56-10-01).

C (24) Send a wire message to MCIES copy MCIMD noting the
C serial numbers of the removed and installed windows and
C the aircraft number.

C C 5. Deactivation of Heating Feature - No. 3 (Aft) L & R Cockpit Side Windows

C A. As indicated in a wire message released 3/15/77 to L-1011 stations, the heating feature on L-1011 aft cockpit windows No. 3 left and right may be inoperative in normal service. Complete and final deactivation will be accomplished after Flight Operations completes their evaluation of window heating requirements. Final deactivation will consist of capping/stowing wires, deletion of switch lights and circuit breakers and removal of controllers.

C B. Until final deactivation is accomplished by a modification order, the following procedures apply to maintenance of No. 3 left and No. 3 right aft windows:

C (1) Installed windows which have an operative heating feature should be allowed to continue operating normally. No maintenance action required.

C (2) Installed windows which are reported to have a malfunctioning heating feature, but are otherwise serviceable, may remain in service and should be deactivated as noted below under "Deactivation."

C (3) Spare windows in stock, which have an inoperative heating feature, may be installed on any L-1011 aircraft. If the heating system is not already deactivated for the window being installed, deactivate as noted below under "Deactivation".

C C. Deactivation Procedure:

C (1) Apply Dymo lable or equivalent placard bearing legend DEACTIVATED above appropriate switch light on the windshield heat control module.

C (2) Depress deactivated switch light so that OFF illuminates.

C (3) Open and band the appropriate AFT PWR omit circuit breaker for window heat. AFT Cont circuit breaker remains closed.

C (4) Apply a metal-cal type M-251 placard (TWA Stk. Nbr 46-1333) on the front cover of the log book indicating deactivation of aft window heat. Fill out placard and make log book entry as required for an "Engineering Watch Item". Refer to GP&P, Chapter/Section 1-10-0, for further details on Engineering Watch Items.

WINDSHIELDS - INSPECTION AND CHECK

1. General

A. Before inspection, external and internal surfaces of the windshield must be cleaned (Ref. 56-10-01, Cleaning). Perform inspection in bright daylight or against a bright
CR and well diffused indirect light source. The optical
CR qualities of any cockpit window or windshield are of prime
CR importance. Impaired vision is usually caused by one of the
CR following reasons: 1) Delamination, 2) Bubbles, or 3)
CR Crazing. In most cases, changes in a cockpit window or
CR windshield that can cause impaired vision develop slowly.
CR When reported, it is imperative that the condition be
CR discussed with the incoming crew to establish its severity.
CR Usually this should not be a cause for immediate replacement
CR unless a drastic change in the condition of the window or
CR windshield has developed. In any regard, a window or
CR windshield that is reported having impaired vision should be
CR replaced at the first opportunity without disrupting the
CR scheduled operation.

B. The main windshields, the forward side windshields, and the aft side windshields are subject to the following inspection and check criteria: cracks, scratches, chipping, crazing, delamination, bubbles, acrylic relaxation and the glass-to-frame edge sealant damage (two forward main windshields).

WARNING: WHEN ELECTRICAL POWER IS ON THE AIRCRAFT, CURRENT THROUGH THE HEATER FILM WILL INDUCE AN ELECTRIC VOLTAGE ON THE OUTER GLASS ANTI-STATIC COATING, WHERE THERE IS A POSSIBILITY OF PHYSICAL CONTACT WITH THE WINDSHIELD PANEL OUTER GLASS, CIRCUIT BREAKERS B15, B16, B18, AND B19 ON FE/SO PANEL CB2 MUST BE OPENED AND TAGGED.

(1) Cracks

A crack is a fissure mostly perpendicular to the surface, which extends all or most of the way through a pane.

(2) Scratches

A scratch is the imprint of a hard and sharp object against the internal surface glass liner of the two forward windshield panels; or the internal and external acrylic surfaces of the side panels; and to the

external acrylic surface of the forward windshield panels.

(3) Chipping (Chips)

Chips are flakes or layers of acrylics or of glass broken from the surface. Conchoidal chips (shell-type) are usually circular or curved with many fine striations. Small voids of the conchoidal type do not normally affect the structural integrity of an acrylic pane. A V-shaped void with a sharp and narrow "V", which appears to propagate towards the interior of the pane needs special attention. Verify that this condition is not the beginning of a crack.

Chips of the narrow V-type occur rarely in chemically tempered glass.

(4) Crazing

Crazing is defined as a series of small fissures perpendicular to the pane surface, but not extending all the way through the pane.

Crazing is the product of exposure to higher than acceptable stress levels, improper application of a "hard coat" to stretched acrylic plastic, or the application of unapproved material substances such as: gasoline, alcohol, benzene, hexane, xylene, acetone, carbon tetrachloride, fire extinguisher fluids or chemicals, lacquer thinners, and/or unapproved window cleaning sprays or de-icing fluids.

(5) Delamination

A delamination is the separation of a glass ply or an acrylic pane from the polyvinyl interlayer.

The delaminated area is usually smooth, has a wet appearance, and shows distortion around the perimeter.

Delamination between the tempered glass ply and the polyvinyl interlayer on the main windshield interior surface does not affect structural integrity.

(6) Bubbles

Bubbles are small inclusions of gas which appear in the polyvinyl interlayers or their boundaries.

(7) Acrylic Relaxation

Acrylic relaxation results from an overheat condition (over approximately 250 degrees F) due to continuous and uncontrolled heating of the windshield caused by a heat controller malfunction. It is almost always accompanied by large bubbles in the vinyl interlayer. There are classes of relaxation defined as follows:

(a) Minor relaxation is visible as a slight shifting, swelling, or rippling of the acrylic surface. This effect will usually occur in the central areas since the edges are cool due to heat transfer to the unheated structure. It should not be confused with the edge separators built into the edge of the lamination and extending approximately 1/2 inch into the vision area. These edge separators are intentional areas of unbounded vinyl layers and appear as a shiny, rippled, or often wrinkled surface.

(b) Severe relaxation is apparent as tears or rippled fissures in the surface of the acrylic. There may be individual or multiple fissures.

(8) Edge Sealant

Edge sealant damage normally consists of erosion, separation from glass, frame (or both), or other physical damage such as cuts and tears.

C. The inside surface of the two forward windshield panels have a hard coat surface on the stretched acrylic plastic surfaces. This hard coat protects against rubs and hairline scratches, but not against possible deeper scratches. Since reapplication of the hard coat on the two windshield panels is not possible, repairing scratches by removing surface material is not recommended.

2. Equipment and Materials

R Optical Micrometer, Model No. 966XB, Monogram Industries, or equivalent

3. Referenced Procedures

21-31-00 Cabin Pressure Control System - Adjustment and Test

56-10-01 Windshield - Removal and Installation

56-10-01 Windshield - Cleaning

56-10-01 Windshield - Edge Seal Repair

4. Inspection/Check

Inspect the main windshields, the forward side windshields, and the aft side windshields, as applicable, for the following:

A. Preparation for Inspection

WARNING: WHEN ELECTRICAL POWER IS ON THE AIRCRAFT, CURRENT THROUGH THE HEATER FILM WILL INDUCE AN ELECTRIC VOLTAGE ON THE OUTER GLASS ANTI-STATIC COATING, WHERE THERE IS A POSSIBILITY OF PHYSICAL CONTACT WITH THE WINDSHIELD PANEL OUTER GLASS, CIRCUIT BREAKERS B15, B16, B18, AND B19 ON FE/SO PANEL CB2 MUST BE OPENED AND TAGGED.

(1) On Flight Engineer/Second Officers overhead circuit breaker panel CB-2, zone 215, open and tag the following circuit breakers:

LEFT WINDOW HEAT - SIDE WINDOWS - FWD PWR

LEFT WINDOW HEAT - SIDE WINDOWS - AFT PWR

LEFT WINDOW HEAT - SIDE WINDOWS - CONT

LEFT WINDOW HEAT - WINDSHIELD - CONT

LEFT WINDOW HEAT - WINDSHIELD - PWR

RIGHT WINDOW HEAT - WINDSHIELD - CONT

RIGHT WINDOW HEAT - WINDSHIELD - PWR

RIGHT WINDOW HEAT - SIDE WINDOWS - CONT

RIGHT WINDOW HEAT - SIDE WINDOWS - FWD PWR

RIGHT WINDOW HEAT - SIDE WINDOWS - AFT PWR

R 5. Thickness Reduction

R (1) Main Windshields

R Remove and replace a window assembly when any damage
R exists that reduces the remaining thickness of the
R outer liner to 0.810 inch or less, or the inner liner
R to 0.630 inch or less.

R (2) Side Windshields

R Remove and replace a window assembly when any damage
R exists that reduces the remaining thickness of the
R outer liner to 0.750 inch or less, or the inner liner
R to 0.600 inch or less, or reduces the overall
R windshield thickness as follows:

R (a) To less than 1.550 inch at any point on the
R transparent surface area.

R (b) To less than 1.340 inch at any point around the
R peripheral attachment area (rabbeted edge).

R C. Cracks in Inner or Outer Acrylic Panes [Para 1B(1)]

(1) Remove and replace windshield assembly (Ref. 56-10-01).

R D. Scratches on tempered glass surfaces on outside surface of
R main windshield panels [Para 1B(2)].

Scratches do not affect structural integrity; however, sharp scratches may cause sudden and progressive cracking of the tempered glass with partial loss of optical quality.

R E. Scratches on Acrylic Surfaces [Para 1B(3)]

R (1) Remove and replace a window assembly when a scratch
R exceeds a depth of 0.040 inch or applicable thickness
R reduction limits described in paragraph 4B are
R exceeded.

R F. Chipping [Para 1B(3)]

(1) Replace any windshield if chip depth exceeds 0.05 inch,
R or applicable thickness reduction limits described in
R Paragraph 4B are exceeded.

R G. Crazing [Para 1B(4)]

R (1) Replace any windshield whenever local crazing depth
R exceeds 0.040 inch when vision is seriously impaired,
R or when applicable thickness reduction limits described
R in Paragraph 4B are exceeded.

R H. Delamination [Para 1B(5)]

(1) Inspect for delamination of the stretched acrylic panes or the tempered glass plies from their polyvinyl layer. A delamination has no direct affect on the structural integrity of the windshield; however, progressive delamination is an indication of windshield degradation

caused by some other failure. Remove and replace a delaminated windshield assembly whenever the optical qualities are degraded to an unacceptable level.

R I. Bubbles [Para 1B(6)]

(1) Small bubbles in the vinyl core are not delaminations. They are formed by a gas liberated under overheat condition at approximately 160 degrees or higher. Windshield replacement is necessary when bubbles impair vision or when the size of any one bubble exceeds 1.5 inches in diameter. The presence of a new large bubble, which is equivalent to an area delamination, may indicate a defective windshield heat control system.

R J. Acrylic Relaxation [Para 1B(7)]

(1) Replace any windshield if acrylic relaxation, minor or severe is visible.

R K. Windshield Edge Seal [Para 1B(8)]

(1) Sealant which is badly eroded, separated from glass or frame, or otherwise physically damaged may be repaired (Ref. 56-10-01).

R L. Windshield Pressure Leak Check

Windshield leaks may be evidenced by the audible sound of leaking air, when the aircraft is pressurized. There are four possible air leak paths through, or around a windshield assembly, as follows:

(1) Potential air leak paths of noise producing air leaks at the windshield (Ref. Fig. 601).

(a) Between windshield retainer assembly and windshield support structure.

(b) Around windshield assembly installation bolt (bolt head or plate nut).

(c) Around windshield retainer assembly pin (pin head or assembly collar).

(d) Along the polysulfide sealant between windshield retainer and outer surface of windshield acrylic pane or glass abrasion shield.

(2) Preparation for windshield air pressurization leak check.

WARNING: WHEN ELECTRICAL POWER IS ON THE AIRCRAFT, CURRENT THROUGH THE HEATER FILM WILL INDUCE AN ELECTRIC VOLTAGE ON THE OUTER GLASS ANTI-STATIC COATING. WHERE THERE IS A POSSIBILITY OF PHYSICAL CONTACT WITH THE WINDSHIELD PANEL OUTER GLASS, CIRCUIT BREAKERS B15, B16, B18, AND B19 ON FE/SO PANEL CB2 MUST BE OPENED AND TAGGED.

(a) Open and tag circuit breakers of windshields to be checked, and adjacent windshields [(Ref. Step 4A(1)].

WARNING: DO NOT OVERTORQUE WINDSHIELD INSTALLATION BOLTS. DO NOT ATTEMPT TO TIGHTEN WINDSHIELD RETAINER ASSEMBLY PINS.

(b) Apply 70 to 80 lb in. torque to all windshield attachment bolts on windshields to be checked.

(c) Station observer in flight station to perform leak check.

(3) Windshield air leak check.

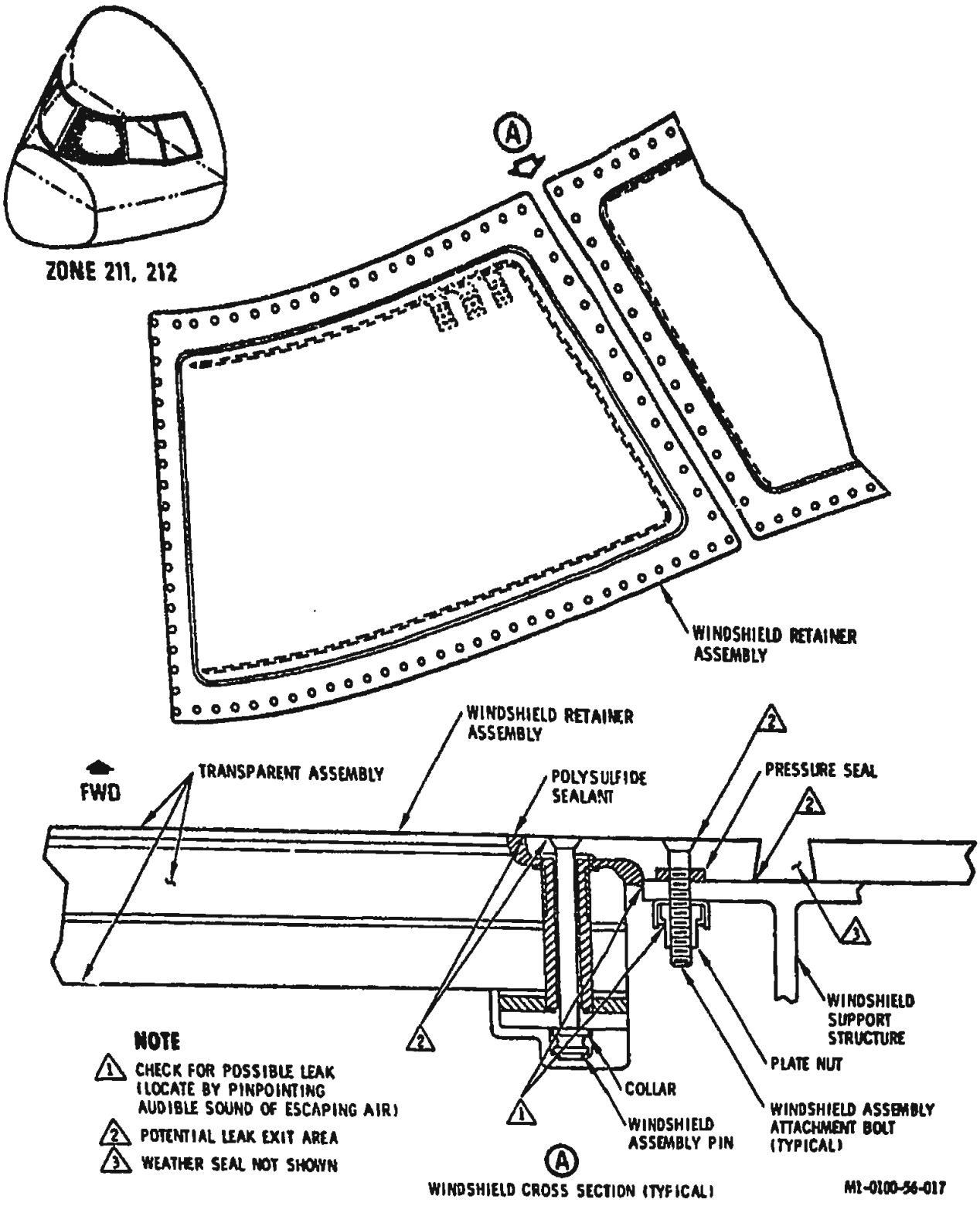
(a) Pressurize aircraft to minimum pressure required to check for noise producing air leaks (Ref. 21-31-00).

(b) With aircraft pressurized, check for whistling or hissing sounds indicating windshield air leak.

(c) If windshield air leak noise condition has been corrected, check may be terminated, if not, continue at Step 4L(3)(d).

(d) If windshield air leak noise condition persists, remove trim from around windshield in area of apparent air leak.

(e) Using a stereo headset with tubing type leads, or suitable length of tubing (to localize source of escaping air) probe along areas suspected of air leakage until leak source is located. Check all leak path locations described in Steps 4L(1)(a) thru 4L(1)(d). Pressurization leakage which are identified around side windshield edges and windshield support structure frame may be caused by excessive sealant bead around outer edge of windshield panel. Excessive sealant prevents proper seating of windshield retainer against supporting structure. This condition may be



Windshield Pressure Leak Check
Figure 601

eliminated by chamfering the support frame edges (Ref. SB56-011).

(f) If leak is identified as having a source identified in Steps 4L(1)(a) or 4L(1)(b), leak may be eliminated by removing windshield and replacing pressure seal (Ref. 56-10-01).

(g) If leak is identified as having a source identified in Steps 4L(1)(c) or 4L(1)(d), windshield should be replaced (Ref. 56-10-01).

(h) Depressurize aircraft (Ref. 21-31-00).

(i) Reinstall windshield trim, if removed.

(j) Close circuit breakers opened in Step 4L(2)(a).

WINDSHIELDS - CLEANING AND PAINTING

1. General

The windshields must be cleaned internally and externally to maintain optical quality.

WARNING: TO ELIMINATE THE POSSIBILITY OF ELECTRICAL SHOCKS WHEN PERFORMING MAINTENANCE ON WINDSHIELDS, OPEN AND TAG THE APPROPRIATE CIRCUIT BREAKERS.

CAUTION: ALWAYS REMOVE DUST, DIRT, GRIME, AND LIME BY FLUSHING WITH CLEAN WATER, IF POSSIBLE, OR BY BLOWING WITH CLEAN, COMPRESSED AIR BEFORE APPLYING CLEANING FLUID, CLEANING COMPOUND, OR PROTECTIVE COMPOUNDS.

DO NOT USE THE FOLLOWING MATERIALS ON ACRYLIC PLASTICS: GASOLINE, ALCOHOL, BENZINE, HEXANE, ZYLENE, ACETONE, CARBON TETRACHLORIDE, FIRE EXTINGUISHER OR
R DEICING FLUIDS, LACQUER THINNERS, RAIN REPELLENT
R REMOVER PADS, OR WINDOW CLEANING SPRAYS BECAUSE THEY SOFTEN THE PLASTIC AND/OR CAUSE CRAZING.

The forward sides of the main windshields (Windshield No. 1 and 2) are tempered glass. The glass has a permanent, antistatic treatment applied at manufacture. All other windshield surfaces are stretched acrylic plastic. The plastic surfaces have a hard-coat film to protect them against hairline scratches.

Waxing and polishing is required after cleaning. Combination compounds for cleaning and waxing are acceptable. Antifogging compounds and antistatic compounds are advisable for the side windshields.

Windshield waxing improves the optical quality. The thin film of wax can fill minute hairline scratches.

2. Equipment and Materials

C Window Towel (TWA Stk. Nbr. 47-1566)

Chamois, clean and oil free

Canton (cotton) flannel, clean and oil-free

Soap, Orvus WA paste or nonabrasive liquid household soap or detergent diluted in water

Aliphatic Naphtha, TT-N-95, Type II or equivalent

R Liquid Cleaner and Wax for Plastics, P-P-560 Type I, Permatex
R Co. Inc., West Palm Beach, Florida, or equivalent

C Cleaner, Look-Out (TWA Stk. Nbr. 50-1259)

Dupont No. 7 Auto Polish and Cleaner, (Johnson's Pride), or equivalent

Bon Ami Cleanser, Faultless Starch Co.

C Rain Repellent, Rainboe, Type 3, Boeing Aircraft Co. (TWA Stk.
C Nbr. 15-3000)

Cerium Oxide, SR-XII, Anomet Inc., Hawthorne, Calif.

Rain Repellent Remover Pad, Leeder 275-G Pads, Leeder Chemicals, Inc, La Mirada, California, or equivalent

3. Cleaning and Waxing

A. Preparation for Cleaning and Waxing of Windshields

WARNING: TO ELIMINATE THE POSSIBILITY OF ELECTRICAL SHOCKS WHEN CLEANING OR WAXING WINDSHIELDS, WINDSHIELD POWER MUST BE OFF.

(1) On Flight Engineer/Second Officers overhead circuit breaker panel CB2, zone 215, open and tag circuit breakers:

LEFT WINDOW HEAT - SIDE WINDOWS - FWD PWR (B12)

LEFT WINDOW HEAT - SIDE WINDOWS - AFT PWR (B13)

LEFT WINDOW HEAT - SIDE WINDOWS - AFT CONT (B14)

LEFT WINDOW HEAT - WINDSHIELD - CONT (B15)

LEFT WINDOW HEAT - WINDSHIELD - PWR (B16)

RIGHT WINDOW HEAT - WINDSHIELD - CONT (B18)

RIGHT WINDOW HEAT - WINDSHIELD - PWR (B19)

RIGHT WINDOW HEAT - SIDE WINDOWS - FWD CONT (B20)

RIGHT WINDOW HEAT - SIDE WINDOWS - FWD PWR (B21)

RIGHT WINDOW HEAT - SIDE WINDOWS - AFT PWR (B22)

B. Cleaning External Surfaces

(1) Remove loosely adhering dirt and grit from windshields by flushing with clean water.

(2) Wipe with a soft damp cloth or sponge. Keep cloth or sponge free of abrasive materials by rinsing it frequently in clean water.

(3) Wash with nonabrasive soap and water. Use a soft cloth, sponge, or chamois to flush and float away dirt particles.

CAUTION: GO OVER SURFACE WITH BARE HAND SO ANY ABRASIVE CAN BE DETECTED AND REMOVED BEFORE IT SCRATCHES THE PLASTIC SURFACE.

ALL RUBBING OPERATIONS ON ACRYLIC PLASTICS MUST BE DONE WITH AS LIGHT A PRESSURE AS POSSIBLE.

(4) Dry windshield with a clean, damp chamois. A clean, cotton-flannel cloth may be used if care is taken not to rub plastic after surface is dry.

WARNING: ALIPHATIC NAPHTHA IS FLAMMABLE AND TOXIC.

CAUTION: DO NOT RUB DRY PLASTIC WITH A DRY CLOTH. THIS WILL CAUSE SCRATCHES AND BUILD UP AN ELECTROSTATIC CHARGE WHICH ATTRACTS DUST PARTICLES.

(5) Remove remaining specks or smudges by rubbing lightly with a cloth wetted with aliphatic naphtha, or equivalent. Dry with a clean, cotton-flannel cloth. If the windshield is stained with a residue of dried rain repellent, refer to Paragraph 3E for cleaning instructions.

(6) Apply cleaning/wax compound as described in Paragraph 3D.

(7) Remove tags and close circuit breakers opened in Step 3A(1).

C. Cleaning Internal Surfaces

WARNING: TO ELIMINATE THE POSSIBILITY OF ELECTRICAL SHOCKS WHEN CLEANING WINDSHIELDS, WINDSHIELD POWER MUST BE OFF.

(1) On Flight Engineer/Second Officers overhead circuit breaker panel CB2, zone 215, open and tag circuit breakers [Ref. Step 3A(1)].

(2) Remove loosely adhering dust, dirt, and grit from inside surfaces of the windshields by blowing with a stream of clean compressed air, then lightly wipe with damp cloth or a damp sponge.

R CAUTION: KEEP CLOTH OR SPONGE FREE OF ABRASIVE MATERIAL.

(3) Apply cleaning/wax compound as described in Paragraph 3D.

(4) Remove tags and close circuit breakers opened in Step 3A(1).

D. Windshield Waxing

WARNING: TO ELIMINATE THE POSSIBILITY OF ELECTRICAL SHOCKS WHEN WAXING WINDSHIELDS, WINDSHIELD POWER MUST BE OFF.

NOTE: This procedure applies to external and internal windshield surfaces, and to the listed cleaning/waxing compounds.

(1) On Flight Engineer/Second Officers overhead circuit breaker panel CB2, zone 215, open and tag circuit breakers [Ref. Step 3A(1)].

(2) Mix cleaning or waxing compound to ensure a homogeneous mixture.

(3) Apply cleaning compound or wax with clean, soft cloth. Use very light pressure and eliminate accumulation of grit on cloth while cleaning. For minute scratches, work at right angle to scratches for best blending action.

(4) Reapply cleaner-polisher as necessary. Wipe off cleaner and polish with a clean, soft cloth.

(5) Polish to a high luster by light polishing with a clean flannel cloth. Polishing may be done before or after cleaning compound or wax has dried.

(6) Remove any streaks or fingerprints from waxed acrylic surface by polishing lightly with a clean flannel cloth. If appearance is unsatisfactory, reapply cleaning compound or wax in accordance with above procedure.

(7) Remove tags and close circuit breakers opened in Step 3A(1).

E. Rain Repellent Removal

When rain repellent fluid is sprayed on the windshield, under rainy conditions, the repellent converts to a gel which spreads over the windshield, and becomes a water-repellent film. During normal usage, in driving rain or hail conditions, this film is abraded and is removed in approximately three to five minutes.

In the event of application of rain repellent in light rain conditions, or inadvertent application under dry air conditions, the repellent residue should be removed at the earliest opportunity, preferably within a few hours after exposure. This will prevent accumulation of dust particles in the residue, and preclude the possibility of staining the glass surface or the surrounding painted areas.

WARNING: TO ELIMINATE THE POSSIBILITY OF ELECTRICAL SHOCKS WHEN CLEANING WINDSHIELDS, WINDSHIELD POWER MUST BE OFF.

(1) On Flight Engineer/Second Officers overheat circuit breaker panel CB2, zone 215, open and tag circuit
R breakers [Ref. Steps 3A(1)].

(2) Remove rain repellent after inadvertent release, system check, or usage under light rain conditions, as follows:

(a) Wash the affected area with clean water and soap or liquid detergent (Ref. Paragraph 3B).

(3) Remove light deposits of dried rain repellent residue as follows:

WARNING: IF SKIN OR EYES ARE ACCIDENTALLY EXPOSED TO RAIN REPELLENT FLUID, THE AFFECTED AREA SHOULD BE IMMEDIATELY AND THOROUGHLY FLUSHED WITH WATER, IRRITATION MAY RESULT.

C (a) Using rubber gloves, soak a window towel with
C liquid rain repellent (obtained from a pressurized
C tank of liquid repellent) and allow saturated
C towel to remain in contact with stained area for
C several minutes. If cloth dries out, apply
C repellent as required to keep cloth moist.

C (b) Scrub softened repellent with towel soaked in
C repellent.

C (c) Rinse with clean water and liquid detergent, and
C wipe dry.

C (d) Clean entire windshield with Look-Out and window
C towel.

C (e) If dried repellent has not been completely
C removed, but some progress has been made toward
C removal of repellent residue, repeat Steps (a)
C through (d).

C (f) If repellent residue still resists removal,
CR continue with Step (4), (5) or (6) as required to
C clean main or side windshields.

(4) On main windshield outer surfaces, rain repellent residue spots that persist after cleaning may be polished as follows:

CAUTION: USE OF POLISHING MATERIALS OTHER THAN BON AMI
R CLEANSER MAY RESULT IN DAMAGE TO THE MAIN
R WINDSHIELDS. THESE POLISHING MATERIALS ARE
R ABRASIVES AND SHOULD ONLY BE USED AS A LAST
R RESORT. USE BON AMI CLEANSER POLISHING
R MATERIAL CAREFULLY AS DESCRIBED BELOW, OR
R DAMAGE MAY RESULT.

R BON AMI MAY BE USED ONLY ON THE MAIN WINDSHIELD GLASS SURFACE (IT SCRATCHES PLASTIC SIDE WINDSHIELDS).

RESTRICT USAGE OF BON AMI TO THE MINIMUM TIME AND AREA REQUIRED TO REMOVE RESIDUE. USAGE OF BON AMI CLEANSER SHOULD BE RESTRICTED TO APPROXIMATELY 60 SECONDS IN ANY ONE LOCALIZED AREA.

(a) Apply Bon Ami cleanser with a water-dampened clean cotton flannel cloth; use medium rubbing pressure. Restrict usage of Bon Ami cleanser to approximately 60 seconds in any one localized area.

(b) Rinse affected area with clean water and liquid detergent; dry with clean flannel cloth (Ref. Paragraph 3B).

(c) Apply cleaning/wax compound as described in Paragraph 3D.

R (5) Alternate method for removing rain repellant from main
R windshields:

WARNING: IRRITATION MAY RESULT IF SKIN OR EYES ARE ACCIDENTLY EXPOSED TO RAIN REPELLANT CLEANING PAD FLUID, THE AFFECTED AREA SHOULD BE IMMEDIATELY AND THOROUGHLY FLUSHED WITH WATER FOR AT LEAST 15 MINUTES, CALL A PHYSICIAN IMMEDIATELY.

CAUTION: FOR USE ON GLASS ONLY (MAIN WINDSHIELDS) - DO NOT USE ON PLEXI-GLASS (SIDE WINDSHIELDS), AS IT WILL DESTROY PLASTICS.

(a) Using rubber gloves, moisten rain repellent remover pads with small amounts of water.

(b) Remove rain repellent residue by rubbing with cleaning pad.

(c) Remove excess cleaning fluid from windshield with clean damp cloth or paper towel.

(d) Wipe off red oxide residue with clean, dry towel or cloth.

(e) Wash affected area (Ref. Paragraph 3B).

(6) On forward and aft side windshield outer surfaces, rain repellent residue spots that persist after cleaning may be polished as follows:

CAUTION: USE OF POLISHING MATERIALS OTHER THAN CERIUM OXIDE MAY RESULT IN DAMAGE TO THE SIDE WINDSHIELDS. THIS POLISHING MATERIAL IS ABRASIVE AND SHOULD ONLY BE USED AS A LAST RESORT. USE CERIUM OXIDE POLISHING MATERIAL CAREFULLY AS DESCRIBED BELOW, OR DAMAGE MAY RESULT.

CERIUM OXIDE MAY BE USED ON SIDE WINDSHIELDS ONLY (IT POLISHES OFF THE TIN OXIDE ANTI-STATIC FILM ON THE MAIN WINDSHIELDS).

(a) Apply cerium oxide with a water-dampened clean cotton flannel cloth; use medium rubbing pressure.

(b) Rinse affected area with clean water and liquid detergent; dry with clean flannel cloth (Ref. Paragraph 3B).

(c) Apply cleaning/wax compound as described in Paragraph 3D.

R (7) Remove tags and close circuit breakers opened in Step 3E(1).

WINDSHIELDS - APPROVED REPAIR

1. General

The Edge Seal repair is applicable to main windshield panels which have zee strips installed around the periphery of the glass. Information is provided for repair of the sealant with the windshield installed on the aircraft. The sealant on the two forward main windshields may become separated from glass or zee strip, eroded (especially in windshield wiper area) or otherwise damaged. The sealant in damaged areas may be removed and replaced with sealant to the original dimensions (Para. 4A) or additional sealant may be applied to correct the defect (Para. 4B).

R Side windshield seal repair procedures are covered in Paragraph
R 4D.

2. Equipment and Materials

R Sealing Compound - PR1425 (Products Research Corp.), or
R equivalent

R Wooden Tongue Depressor

R Cleaner - aliphatic naptha, Federal Specification TT-N-95, Type
R II, or equivalent

R Clean Rags

R Medium-fine Sandpaper

Caulking gun and nozzle

Windshield cover

Masking tape

Plastic or wood scraper - Local Fabrication. Scarf angle, width and thickness as required.

3. Referenced Procedures

56-10-01 Windshields - Cleaning and Painting

4. Approved Repairs

A. Edge Seal Repair

CAUTION: EXERCISE EXTREME CAUTION TO PREVENT DAMAGE TO GLASS. USE OF A PROTECTIVE COVER IS RECOMMENDED TO COVER ENTIRE GLASS SURFACE EXCEPT IMMEDIATE AREAS TO BE REPAIRED. MASKING TAPE IS SUITABLE FOR HOLDING COVER IN POSITION.

(1) Check sealant around edge of glass to determine areas that require repair.

(2) Install protective cover on windshield.

(3) Using scraper, remove damaged areas as required.

NOTE: If original sealant is removed to zee strip and glass, remove sealant residue using clean cloth dampened with cleaner. Wipe dry with clean dry cloth.

(4) Apply sealant to damaged areas (Ref. Fig. 801).

(5) Using wood or plastic tool, smooth and fair to original sealant contour.

(6) Remove excess sealant as required.

(7) Allow to cure. Select cure condition most suitable to situation.

Normal cure - 75(±10)°F for 72 hours.

Tack-Free cure - 75(±10)°F for 4 hours

Accelerated cure - 75(±10)°F for 1/2 hour, followed by temperature of 125(±10)°F for 3 hours.

(8) Remove protective cover.

(9) Clean windshield (Ref. 56-10-01, 701).

B. Optional Edge Seal Repair

(1) Clean areas to be repaired.

(2) Install protective cover on windshield.

(3) Apply sealant to dimensions shown in Figure 801.

(4) Smooth sealant to fair with existing sealant.

(5) Remove excess sealant.

(6) Allow to cure as specified in Step 4A(7).

(7) Remove protective cover.

(8) Clean windshield (Ref. 56-10-01, 701).

C. Windshield Surface Repair

Refer to Overhaul Manual, Chapter 56-10-01.

R D. Side Windshield Seal Repair

R (1) Using masking tape, mask around area where sealant is
R to be removed to prevent damage to outer acrylic liner,
R or outside glass, trim and retainer assemblies (Ref.
R Fig. 802).

R (2) Using plastic or wood scraper, cut out sealant in
R suspect leakage area as required, a minimum depth of
R 1/8 inch.

R CAUTION: DO NOT SCRATCH ACRYLIC PLASTIC, TRIM OR RETAINER
R ASSEMBLIES.

R (3) Using medium-fine sandpaper, lightly scuff-sand
R weathered outer surface of sealant where new sealant
R will be applied to lap over and fair in.

R WARNING: USE CLEANING MATERIALS IN A WELL-VENTILATED AREA.
R DO NOT INHALE VAPORS OR ALLOW CLEANING MATERIALS
R TO COME IN CONTACT WITH THE SKIN. KEEP CLEANING
R MATERIALS AWAY FROM OPEN FLAMES.

R (4) Dampen a rag with aliphatic naptha, and wipe all
R surfaces clean where new sealant is to bond. Wipe dry
R immediately using a separate, clean, dry rag.

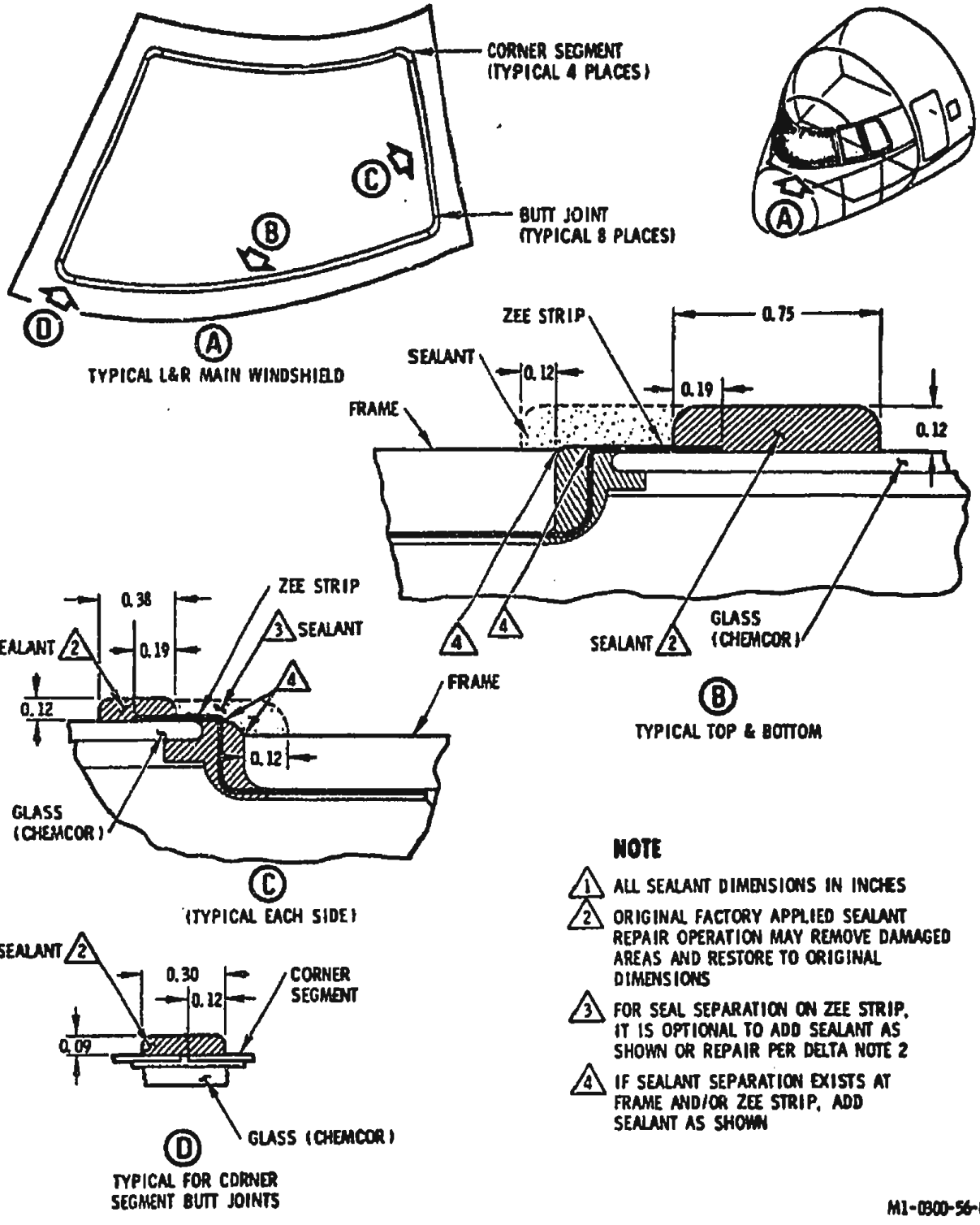
R (5) Mix PR1425 sealant in accordance with manufacturer's
R instructions.

R (6) Inject PR1425 sealant into cavity as required, taking
R care not to trap any air bubbles or spaces within
R sealant.

R NOTE: Cavities up to 6 inches long may be filled by
R pressing the sealant into place with a plastic
R or wooden scraper. Longer cavities should be
R filled by injection from caulking gun.

R (7) Fair new sealant to conform to contour of old sealant
R by using wooden tongue depressor, or similar tool. The
R new sealant must lap onto scuff-sanded, freshly-cleaned
R outer surface of old sealant approximately 1/4 to 1/2
R inch. Observe pre-cure application specifications
R (Ref. Fig. 802).

R (8) Cure sealant repair area for length of time recommended
R by manufacturer.

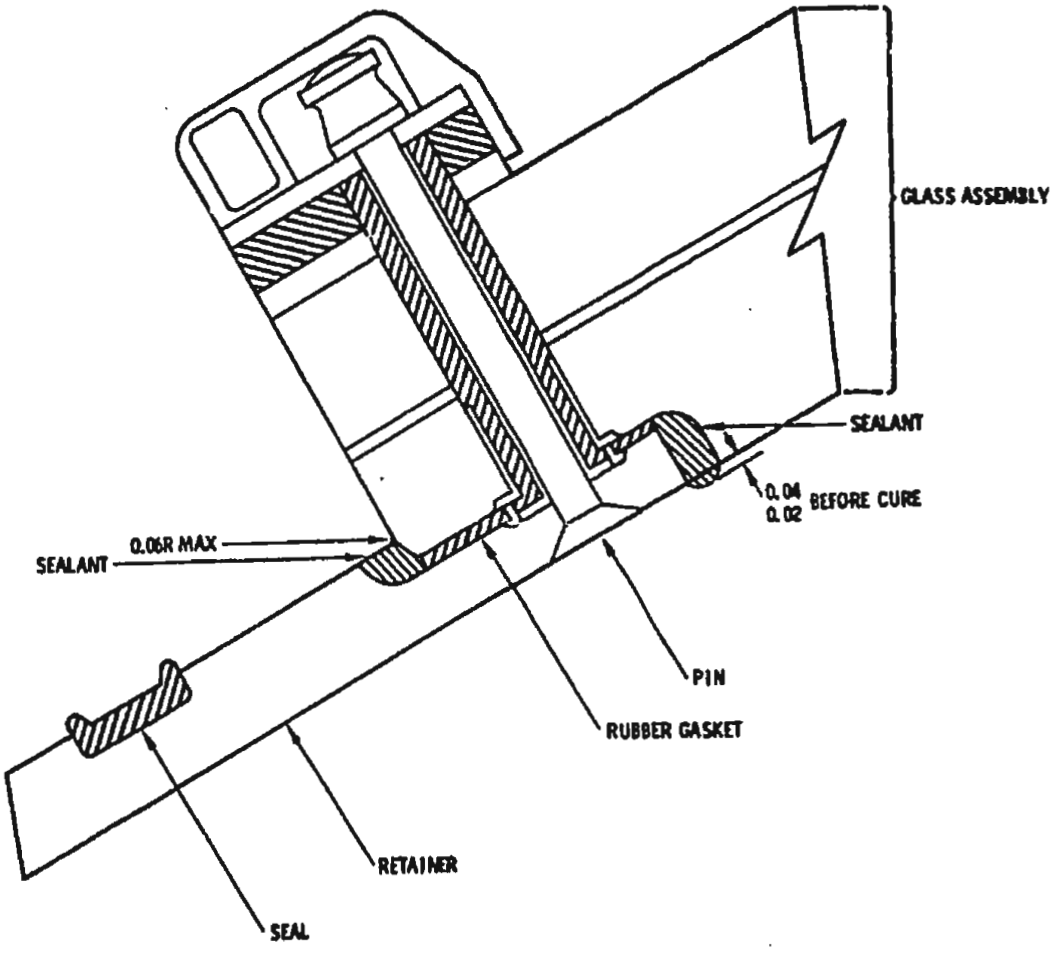


NOTE

1. ALL SEALANT DIMENSIONS IN INCHES
2. ORIGINAL FACTORY APPLIED SEALANT REPAIR OPERATION MAY REMOVE DAMAGED AREAS AND RESTORE TO ORIGINAL DIMENSIONS
3. FOR SEAL SEPARATION ON ZEE STRIP, IT IS OPTIONAL TO ADD SEALANT AS SHOWN OR REPAIR PER DELTA NOTE 2
4. IF SEALANT SEPARATION EXISTS AT FRAME AND/OR ZEE STRIP, ADD SEALANT AS SHOWN

M1-0300-56-023

Windshield Sealant Repair
Figure 801



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R Side Windshield Sealant Repairs
R Figure 802

R EFFECTIVITY: ALL
R
001B

MISSING WINDSHIELD ATTACHMENT BOLTS - MAINTENANCE PRACTICES

1. General

The main forward and side windshield panels may have multiple missing and broken attachment bolts subject to the condition that a minimum of two intact bolts are installed on each side of any missing bolt. In such cases, the hole(s) may be plugged with a commercial plastic anchor insert and screw (Ref. Fig. 201).

2. Equipment and Materials

CR Plastic Anchor Mfr. P/N D529-073-08220 (TWA Stk. Nbr. 70-6283).

Recessed Head Screw, No. 10, coarse threads, 1/2-inch long

Sealing Compound - PR 1422, Class B-2 (Products Research Co.), or equivalent

Cleaner - O-T-620-1, 1, 1 - Trichloroethane or equivalent

Cleaning Rags as required

3. Plugging and Sealing of Missing Bolt Hole

(1) Clean hole area as required.

(2) Wipe cleaned area with clean dry cloth.

(3) Apply thin coat of sealant to exterior surface of plastic anchor and insert fully into hole.

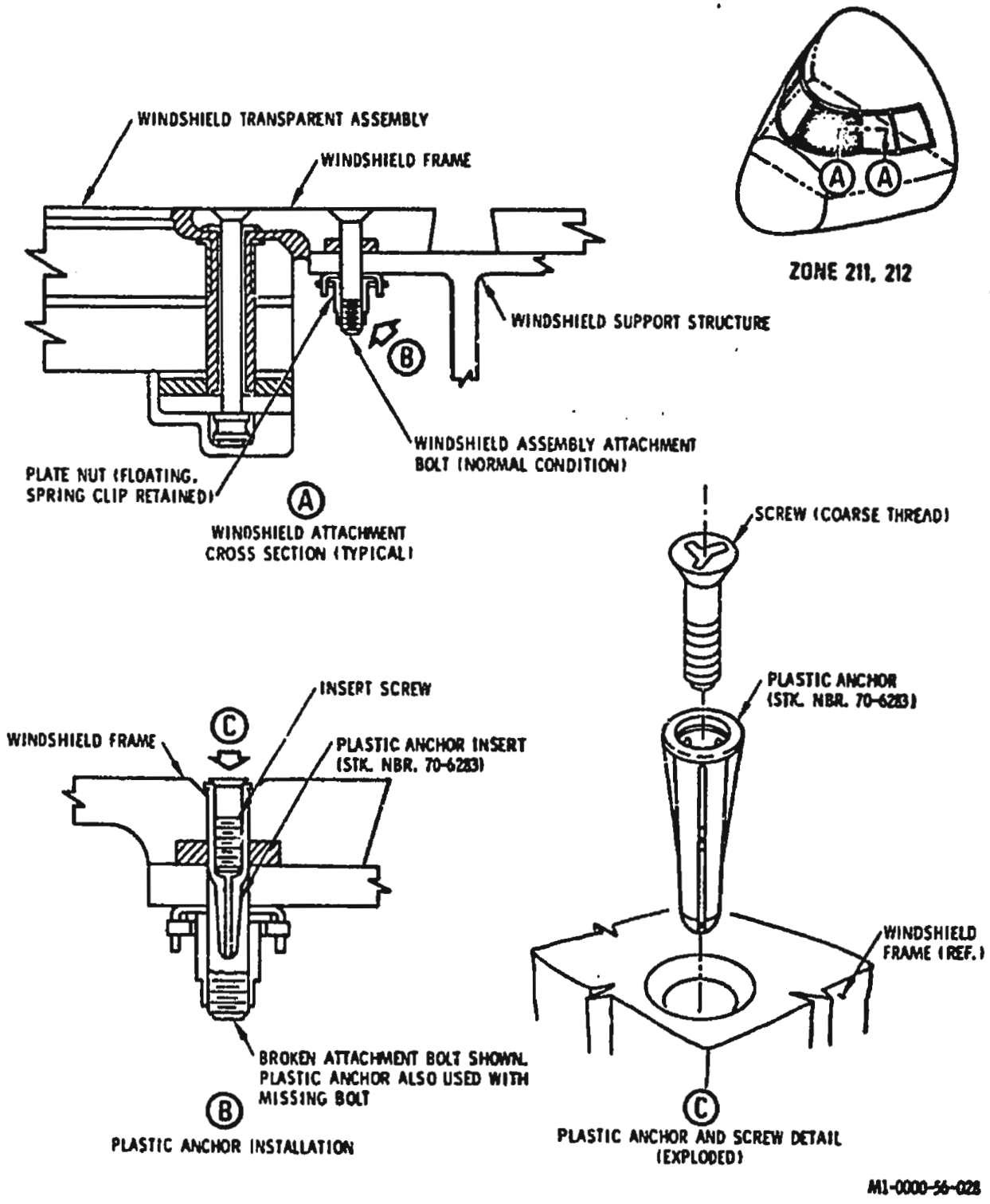
NOTE: In case the plastic anchor cannot be fully inserted into the hole, the tapered end may be cut back as required.

(4) Apply thin coat of sealant to threads of No. 10 screw.

(5) Install screw into plastic anchor.

(6) Remove extruded sealant from area outside of plastic anchor and screw.

(7) Make appropriate entry in log book.



CR Plugging and Sealing of Missing Bolt Hole
CR Maintenance Practices
CR Figure 201

CABIN WINDOWS - DESCRIPTION AND OPERATION

1. General

R R R Windows are double-paned assemblies approximately 9-1/2 inches by 13-1/4 inches. Passenger compartment windows are spaced 20 inches apart (Ref. Fig. 1). Each pane is capable of carrying full cabin pressurization loads. Each window transparent assembly consists of an inner and outer pane of stretched acrylic mounted in a molded one-piece grooved silicone rubber seal. For cabin window location with respect to fuselage station, refer to 6-20-00, Fuselage Station Diagram, Figure1.

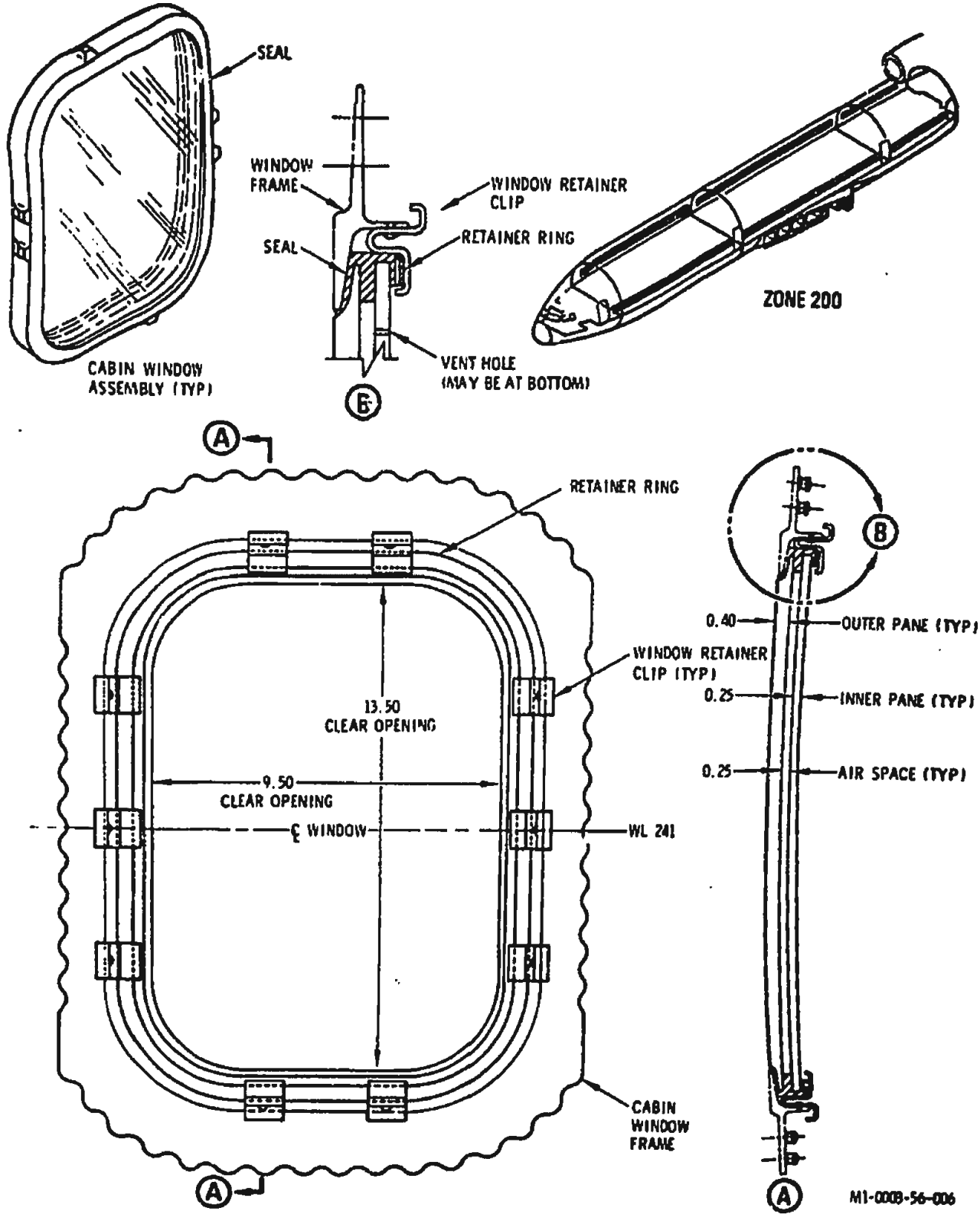
A. Passenger Compartment Windows

The transparent assembly in the passenger compartment is retained in the window frame forging by U-shaped spring-steel retainer clips, and a retainer ring. The seal provides the closure between the frame, the outer pane, and the inner pane. The spring retainer clips and retainer ring compress the seal tightly against the panes and frame to R R form a pressure seal. An air breather hole is located near the edge of the inner pane. The passenger compartment windows are protected by scratch panels. Each scratch panel is part of the window reveal which is located directly behind the shade installation (Ref. Chapter 25).

B. Galley Compartment Windows

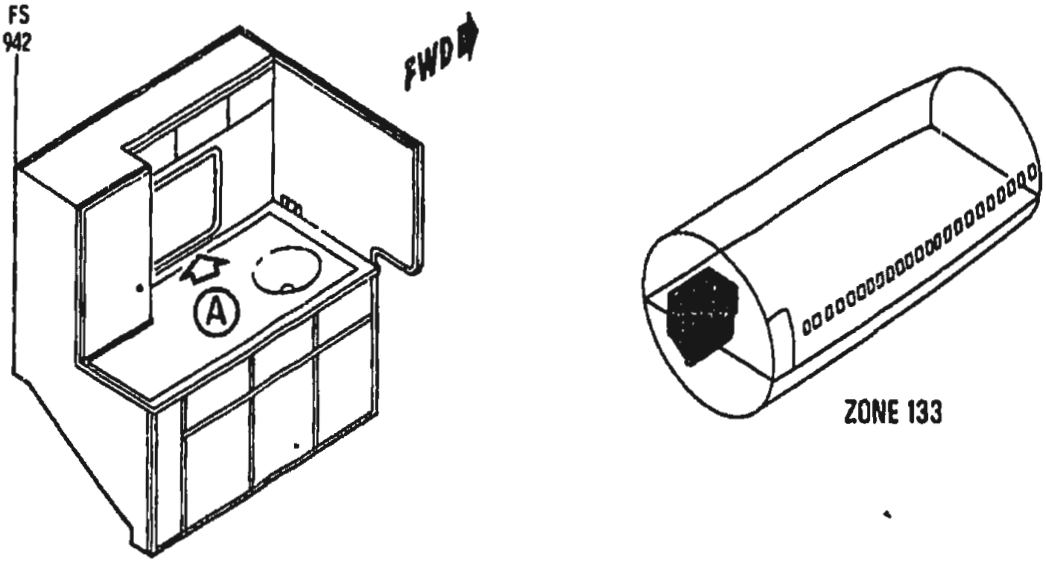
The galley compartment window is located on the left side above the work counter. The window arrangement consists of a window directly above the work counter, an internal tunnel shroud, a pressure holding transparent assembly in the fuselage structure, and an external window boot and pane installation in the MLG fairing (Ref. Fig. 2 and 3).

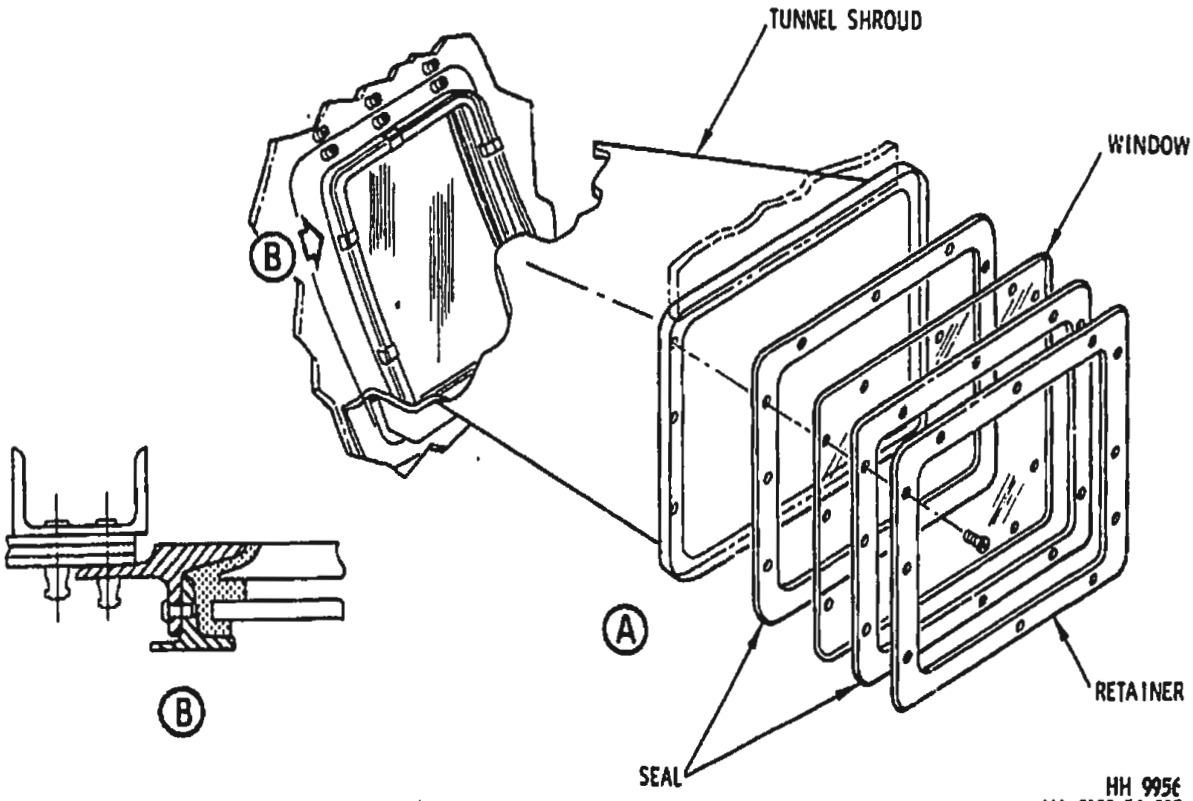
The transparent assembly of the galley compartment window is retained by a combination of snap-in retainer clips and screw-on retainers for window retention and sealing in case of aircraft ditching. The external boot and window pane is attached to the MLG fairing panel 191D. The window pane is of streched acrylic plastic and formed to fairing contour. This fairing window protects the pressurized transparent assembly from being hit by particles thrown by the MLG wheels. The fairing window pane can be replaced without removal of the MLG fairing.



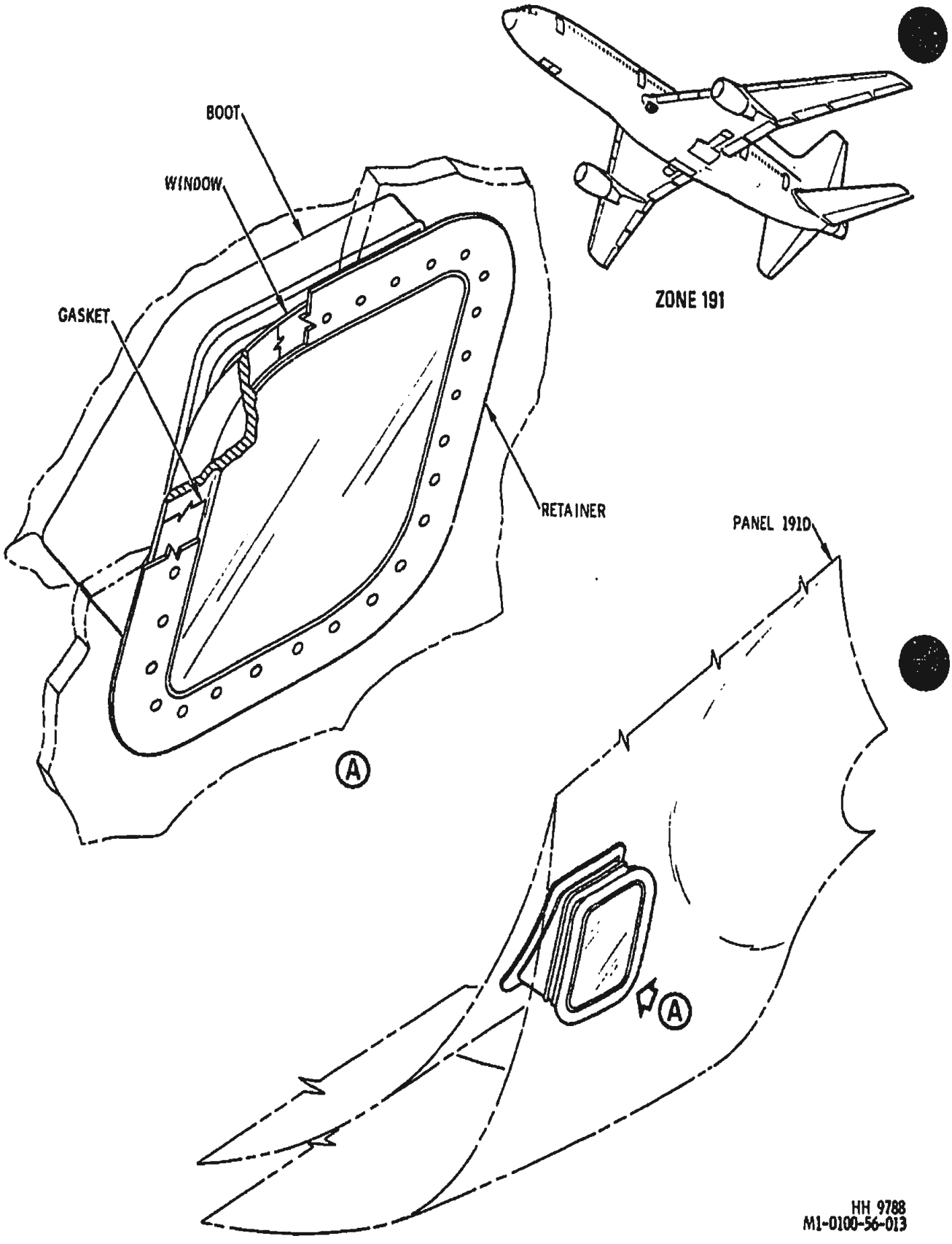
R
R

Passenger Compartment Windows
Figure 1





R Galley Compartment Window
R Figure 2



R Galley Window Extension - MLG Fairing
R Figure 3

R CABIN WINDOWS - MAINTENANCE PRACTICES

R 1. Passenger Window Damage by Hot Lights

R A. Airplanes are occasionally used in television or motion-picture production. For photography inside the airplane, the desired cabin lighting is often augmented by camera lights outside the airplane projecting light into the cabin through the windows. Since typical camera lights radiate considerable heat, this arrangement can, and has caused damage to the window outer panes. Whenever windows are to be subjected to high temperatures, cooling fans, or equivalent, must be used to prevent buildup of heat.

R B. At about 225°F, stretched acrylic begins to deform and revert to its unstretched state and the strength properties of the deformed material are significantly reduced. Hot light damage should be detectable by a dished or concave appearance of the outer surface of the window. It may be confined to only a portion of the surface. In severe cases, the pane may have started to pull away from the frame. When inspecting from inside the cabin, the pane may exhibit distortion; in severe cases, some areas may have a watery appearance, and the inner and outer panes may be in contact.

R C. Personnel working with camera lights should be cautioned about the possibility of damaging the windows. The windows should not be allowed to become too hot to touch. After lights are removed, the windows must be inspected for evidence of possible damage.

PASSENGER COMPARTMENT WINDOW - REMOVAL AND INSTALLATION

1. Referenced Procedures

25-21-04 Seat Assembly - Removal and Installation

25-26-20 Passenger Compartment Window Reveals and Shades - Removal and Installation

2. Removal/Installation

A. Removal

(1) Remove seat assembly if required to gain access to window trim panel (Ref. 25-21-04).

(2) Remove window reveal and scratch panel to gain access to window (Ref. 25-26-20).

(3) Remove window retainers by compressing retainer clip and disengaging protruding rivet from hole in window frame. Protect window pane to prevent scratches by retainer clip with disengagement (Ref. Fig. 401).

(4) Remove retainer ring.

(5) Remove window assembly.

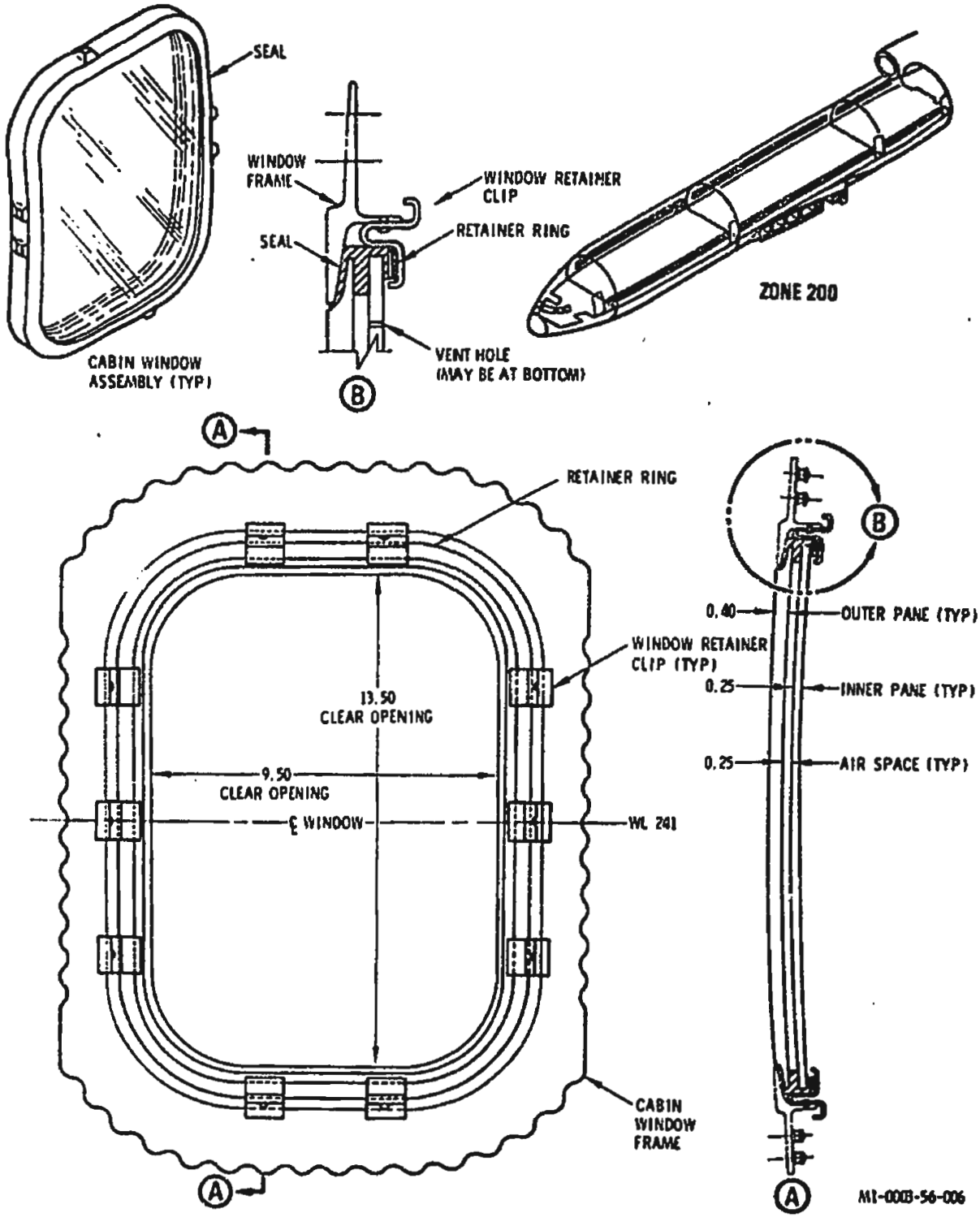
B. Installation

(1) Check that the window panes and the sealing areas on the frame are clean.

R (2) Install window assembly with inner pane vent hole up or
R down (Ref. Fig. 401).

(3) Position window retainer ring on inboard face of window seal and center window assembly in window frame.

(4) Install window retainer clips while maintaining the centered window position. Check that retainer clip rivets are inserted in window frame holes. In case of a necessary removal of a retainer clip, protect window pane to prevent scratches by the retainer clip.



R
R Passenger Compartment Windows
Figure 401

EFFECTIVITY: ALL

0018

PASSENGER COMPARTMENT WINDOWS - INSPECTION AND CHECK

1. General

This procedure is applicable for the passenger cabin windows, galley door (G-1) window and galley compartment viewing window, located on left side, outboard of the work counter at FS 912.

Windows are inspected for the following defects:

(1) Cracks

(2) Scratches

(3) Crazing

(4) Chips or gouges

Window assemblies which have damage to either the inner or outer pane, beyond allowable limits, must be replaced or repaired.

2. Equipment and Materials

Optical Micrometer - Model No. 966XB, Monogram Industries, or equivalent

3. Referenced Procedures

	56-21-01	Passenger Compartment Window - Removal and Installation
	56-21-01	Passenger Compartment Window - Approved Repair
R R	56-21-02	Galley Compartment Window - Removal and Installation
R	56-31-02	Galley Door Window - Removal and Installation

4. Inspection/Check

A. Inspection

R R R R (1) Inspect inner and outer surfaces of inner and outer panes of each window assembly. If a crack is found in any of the surfaces, the window assembly must be replaced.

NOTE: For removal/installation instructions, refer to 56-21-01, 56-21-02 or 56-31-02 as applicable.

A crack in any of the surfaces of either pane is a nonrepairable defect.

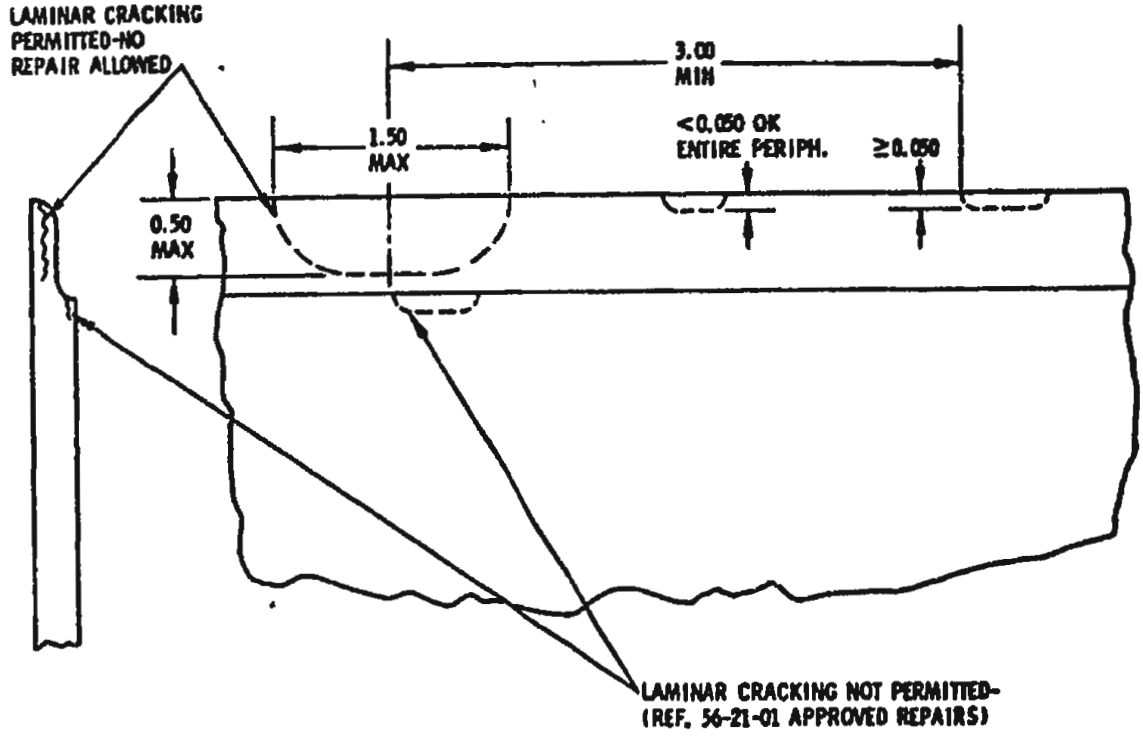
(2) Inspect routed edge of outer pane of each window assembly. If laminar cracks are found the pane must be replaced or repaired per Figure 602.

NOTE: For removal/installation instructions, refer to 56-21-01, 56-21-02 or 56-31-02, as applicable.

(3) Inspect inner and outer panes of each window assembly.
R If defect on outer window pane is in excess of 0.015
R inch in depth, or defect on inner window pane is in
R excess of 0.010 inch in depth, window pane must be
R repaired or replaced prior to flight.

R NOTE: Windows with surface defects greater than 0.005
R inch deep may have a greater service life when
R repaired before maximum allowable depth is
R reached. An optical micrometer, or equivalent,
R may be used to aid inspection. Refer to
R 56-21-01, Approved repairs for details

NOTE: For removal/installation instructions, refer to 56-21-01, 56-21-02 or 56-31-02 as applicable.



NOTE
ALL DIMENSIONS ARE SHOWN IN INCHES

M1-0101-56-076

R
R Outer Cabin Window Pan Laminar Cracking Limits
Figure 601

EFFECTIVITY: ALL

001B

PASSENGER COMPARTMENT WINDOWS - APPROVED REPAIRS

1. General

This procedure is applicable for the following windows:

Passenger Compartment

Galley Door (G-1) Compartment Window

Limited damage to window pane surfaces may be repaired by sanding, polishing, buffing or some combination thereof. The most common types of damage are scratches, crazing and chips.

A. Chips or scratches in the passenger compartment windows are removed by sanding, polishing, or buffing.

B. Scratches are divided into three types: superficial, minor, and major. Superficial scratches are those which may be caused by careless removal of traffic film or by rubbing dry cheesecloth over the panel depth is under 0.001 inch. Minor scratches do not have a buildup on the sides and are from 0.001 to 0.004 inch in depth. Major scratches are over 0.004 inch in depth and usually have a buildup on both sides of crevice.

C. Use care when handling windowpanes to avoid additional damage.

(1) Cover unscratched areas with protective coating or tape.

(2) Handle polished panes only when wearing clean, cotton gloves.

(3) Do not use unapproved materials.

(4) Take care not to scratch the window surface with finger rings or other sharp objects.

2. Equipment and Materials

Abrasive Paper - Wet or dry 400 and 600 grit

Buffing Compound - Brolite, Andrew Brown Co., or equivalent

Buffing Compound - Dupont No. 2VZ-20006, E.I. Dupont Co., or equivalent

R Buffing Wheel - 3-inch diameter flannel, loosely stitched

R Buffing wheels - Assorted, as required, up to 8-inch diameter

R Buffer - 1500 RPM, or equivalent

R Buffer Holding Fixture - Local design and manufacture

R Buffing and Polishing Cloth For Acrylic Plastic; 12000, 8000,
R 6000, 4000, 3200, and 2400 grit - FSCM Micro-Surface Finishing
R Products Inc., (FSCM 32834), or equivalent

R Clear Liquid Dish Washing Detergent

R Cutters - Number of blades, width and diameter as required (up
R to 3-inches diameter). Back angle of approximately 10 degrees
R and rake angle of 20 to 30 degrees should be satisfactory.

R Foam Rubber Block, 1 by 3 by 4 inches, No. SCE 43 or SCE 41 -
R Rubatex Corp., (FSCM 82942), or equivalent

R Liquid Cleaner and Wax For Plastics, Fed. Spec. P-P-560-Permatex
R Co., (FSCM 77247), or equivalent

R Liquid Cleaner For Glass and Acrylic Plastic, MS-260-Miller
R Stephanson Chemical Co., Inc., (FSCM 18598), or equivalent

R Optical Micrometer - Model No. 966X8 Monogram Industries, or
R equivalent

R Polish, Simonize Wax - Simonize Co., or equivalent

R Protective Tape - Scotch No. 600 (1 or 2-inch width) Minnesota
R Mining and Manufacturing Co., or equivalent

R Protective Coating Material - Spraylat Corp., (FSCM 87354), or
R equivalent

R Rymple Cloth, No. 301, Purified Crimped Polishing Fabric -
R Kendall Co., Fiber Products Division (FSCM 75271), or equivalent

R Window Pane Holding Fixture - Local design and manufacture

3. Referenced Procedure

56-21-01 Passenger Compartment Windows - Removal and Installation

R 56-21-02 Galley Compartment Window - Removal and
R Installation

R 56-31-02 Galley Door Window - Removal and Installation

4. Approved Repairs

WARNING: SAFETY GLASSES MUST BE WORN DURING ALL BUFFING OPERATIONS.

CAUTION: DO NOT REMOVE MORE MATERIAL THAN REQUIRED TO CORRECT ANY TYPE OF DEFECT.

CONTINUOUS FLOW OF WATER IS RECOMMENDED DURING SANDING OR BUFFING TO AVOID HEAT BUILDUP AND/OR ACRYLIC ACCUMULATION ON SANDPAPER OR BUFFER (WHICH MAY CAUSE ADDITIONAL DAMAGE TO WINDOW PANE).

HOWEVER, IF CONTINUOUS WATER FLOW IS NOT FEASIBLE, USE WATER SOAKED SANDPAPER AND CLEANSE FREQUENTLY; IF BUFFING, CLEAN OUTER SURFACE OF BUFFING WHEEL WITH CLEAN CLOTH AS REQUIRED. IN EITHER CASE IT IS IMPORTANT TO AVOID BUILDUP OF HEAT IN WINDOW PANE. THIS IS BEST ACCOMPLISHED BY INTERMITTENT SANDING OR BUFFING.

NOTE: It is considered preferable to remove damaged windows from aircraft for repair. However, minor defects may be repaired with windows installed. The procedures which follow are based on window removal. Therefore, if repair is accomplished with the window installed, disregard procedural steps relating to window removal and installation.

Refer to Figure 801 or Figure 802, as applicable, for determination of type of window pane defect, extent of damage and selection of repair procedure.

A. Minor Defect Repair

R This repair procedure is used for scratches and minor crazing up
R to 0.002 inch deep. For each step requiring use of rymple
R cloth, a fresh, clean, unused cloth must be used. Do not reuse
R cloths which have already been used.

R (1) If desired, remove applicable window from aircraft
R (Ref. 56-21-01, 56-21-02 or 56-31-02).

R CAUTION: WINDOW BEING REPAIRED MUST BE COOL (LESS THAN 90
R DEGREES FAHRENHEIT/32 DEGREES CENTIGRADE) AND IN A
R SHADED AREA TO PREVENT WINDOW DAMAGE.

R (2) Wash window using clean rymple cloth and water
R containing a small amount of liquid detergent.

R (3) Flush window with clear water and wipe dry with clean
R rymple cloth.

R (4) If window is not clean, use liquid cleaner, MS-260 to
R remove wax, grease or other foreign matter.

R (5) Flush window with clear water and wipe dry with clean
R rymple cloth.

R (6) Repeat Steps 4A(2) thru 4A(5) as necessary to ensure
R window is clean of all foreign matter and particles.

R (7) Wrap number 2400 buffing cloth around a foam rubber
R block.

R NOTE: Buffing cloth number 3200 may be used in stead
R of 2400 if hairline scratches or light crazing
R is less than 0.001 inch deep.

R Firmer foam rubber block No. SCE 43 is
R preferred, but where a softer touch is desired,
R No. SCE 41 may be used.

R CAUTION: RUBBING WITH TOO MUCH PRESSURE MAY CAUSE LOCALIZED
R OVERHEATING AND SURFACE STREAKS.

R (8) Lightly rub wrapped block over area of scratch or haze.
R Alternate rubbing strokes in horizontal and vertical
R directions at 10 to 15 second intervals until scratches
R are not visible in buffed area.

R NOTE: Slap buffing cloth against the hand as necessary
R to remove acrylic dust.

R (9) Wipe window with clean rymple cloth dampened with
R water.

R (10) Dry window with clean, dry rymple cloth.

R (11) Repeat Steps 4A(7) and 4A(8) using number 3200 buffing
R cloth. Work only long enough to buff to a uniform
R finish over a slightly larger area than buffed in Step
R 4A(8).

R (12) Clean and dry as in Step 4A(9) and 4A(10) using fresh
R clean rymple cloths.

R (13) Repeat Steps 4A(7) and 4A(8) using number 4000 buffing
R cloth. Work only long enough to buff to a uniform

R finish over a slightly larger area than buffed in Step
R 4A(11).

R (14) Clean and dry as in Steps 4A(9) and 4A(10) using fresh
R clean rymple cloths.

R (15) Repeat Steps 4A(7) and 4A(8) using number 6000 buffing
R cloth. Work only long enough to buff to a uniform
R finish and over a slightly larger area than buffed in
R Step 4A(13).

R (16) Clean and dry as in Steps 4A(9) and 4A(10) using fresh
R clean rymple cloths.

R (17) Inspect buffed area.

R NOTE: If buffed area is not acceptable, buffing and
R cleaning procedure may be repeated using number
R 8000 buffing cloth.

R If buffed area is still not acceptable, buffing
R and cleaning procedure may be again repeated
R using number 12,000 buffing cloth.

R (18) Clean window with liquid cleaner, MS-260.

R (19) Apply liquid cleaner and wax, P-P-560, to window
R surface and allow to dry.

R CAUTION: EXCESSIVE PRESSURE ON THE CLOTH CAN RUB IN
R HAIRLINE SCRATCHES.

R (20) Lightly hand polish window to a high luster.

R (21) Examine area where scratches were removed for optical
R distortion by standing five feet away and looking
R directly through window at a straight line object at
R least 30 feet away.

R NOTE: A straight line object such as buidling framing,
R fences, wires or poles are best.

R (22) Move head slightly up and down, and left to right while
R looking through repaired area. Distortion will be
R apparent as curving, wiggling, or breaking of the
R straight lines of object viewed.

R NOTE: After repair, optical distortion should not be
R noticeably degraded as compared to the to
R optical quality in the area before the repair
R was made.

(23) Reinstall applicable window if removed in Step 4A(1).

B. Major Defect Repair

NOTE: This repair procedure is for scratches, chips or crazing conditions that can be corrected and meet window pane minimum thickness requirements upon completion of repair.

Outer windows with repairable defects in excess of 0.015 inch must be repaired or replaced prior to flight.

Inner windows with repairable defects in excess of 0.010 inch must be repaired or replaced prior to flight.

One or more repairs may be made consistent with minimum window pane thickness. This repair is for outer window Area A (Ref. Fig. 801). Repairs located in Area B are covered in Paragraph 4C and Figure 802.

(1) Remove applicable window from aircraft (Ref. 56-21-01, 56-21-02 or 56-31-02).

(2) Cover undamaged side of window pane with protective film, tape or paper.

(3) Remove loose dirt, grit, etc., with compressed air.

(4) Clean window pane using plastic cleaning compound (Permatex or MS-260) applied with clean rymple cloth.

(5) Determine depth of defect using optical micrometer or equivalent.

(6) Sand defective area (approximately 4 inches around defect) with water soaked, wet or dry, 400-grit abrasive paper (Ref. Paragraph 4 CAUTION note).

(7) Remove sanding abrasion marks by sanding with water soaked, wet or dry, 600-grit abrasive paper.

(8) Buff defective area with Dupont buffing compound, or equivalent, using 1500-rpm buffer. Use loosely stitched flannel buffing wheel.

(9) Remove residual buffing compound and acrylic residue with clean rymple cloth as often as required.

(10) Buff defective area with Brolite rubbing compound, or equivalent, using 1500-rpm buffer. Use loosely stitched flannel buffing wheel.

CAUTION: EACH BUFFING COMPOUND MUST BE USED WITH A NEW BUFFING WHEEL.

(11) Remove residual buffing compound and acrylic residue with clean rymple cloth as often as required.

(12) Apply thin coat of Simonize wax polish or MS-260 cleaner, or equivalent, and lightly buff or hand polish entire window pane. If buffed, use new buffing wheel.

(13) Check that window pane thickness in repaired area is within limitations (Ref. Fig. 801).

R (14) Remove protective cover on window pane.

R (15) Reinstall applicable window removed in Step 4B(1).

C. Outer Window Pane Edge Repair

NOTE: This repair procedure applies only to defects along the outer edge of the outer window pane. Figure 802 indicates the affected area, limitations of repair, typical cutters and informational notes.

In order to accomplish this repair and maintain the requirements, holding fixture(s) are required for the window panel and router. The holding fixture(s) must be locally designed and manufactured.

(1) Remove applicable window from aircraft (Ref. 52-21-01, 56-21-02 or 56-31-02).

(2) On undamaged side of window pane, clean surface and install protective cover (tape, paper, etc.)

(3) Determine depth of defect using optical micrometer or equivalent.

NOTE: It should be noted (Ref. Fig. 802, View A) that the maximum depth of defect is located at edge of pane and becomes progressively less, as indicated by the shaded area sloping line.

(4) Install window pane in holding fixture.

(5) Install router (1500 rpm) in holding fixture.

(6) Select cutter tool and install on router spindle.

(7) Make cut(s) through defective area until defect has disappeared.

(8) Use buffer and 240 grit wet or dry abrasive paper to remove tooling marks.

(9) Use buffer and 400 grit, followed by 600 grit wet or dry abrasive paper to remove any remaining tooling or hairline marks.

(10) Using 3-inch diameter, loosely stitched flannel buffing disc and plastic cleaning compound or MS-260 cleaner, polish repaired area.

(11) Measure thickness to ensure that it complies with the following requirements:

R (a) Maximum depth of defect in outer pane - 0.015 inch. Polish defects out by polishing entire viewing surface. Minimum thickness of outer window pane after one or more repairs - 0.280 inch (Ref. Fig. 802).

R (b) Maximum depth of defect in inner pane is 0.010 inch. Polish defects out by polishing entire viewing surface. Minimum thickness of inner window pane after one or more repairs - 0.210 inch [Ref. Fig. 801 (Sheet 1)].

R (12) If required, reinstall window removed in Step 4C(1).

(13) If repaired window pane is returned to stock, clean repaired side of pane and apply protective cover.

	DEFECT	DEFECT DEPTH	REPAIR LENGTH LIMITS		REPAIR PROCEDURE
			AREA A	AREA B	
			SEE SHEET 2		DETERMINE DEPTH OF DEFECT AND SELECT REPAIR PROCEDURE THAT WILL CORRECT DEFECT AND REMOVE LEAST AMOUNT OF PANEL MATERIAL
OUTER PANE	SCRATCH OR CHIP	0.015 INCH MAXIMUM (1)	NO LIMIT	NO LIMIT	
	CRAZING	0.015 INCH MAXIMUM (1) (2)	NO LIMIT	NO LIMIT	
	CRACKS	REPLACE PANE			
INNER PANE	SCRATCH OR CHIP	0.010 INCH MAXIMUM (1)	NO LIMIT	NO LIMIT	
	CRAZING	0.010 INCH MAXIMUM (1) (2)	NO LIMIT	NO LIMIT	
	CRACKS	REPLACE PANE			

CAUTION

(1) A DEFECT IN EXCESS OF THIS DIMENSION MUST BE CORRECTED, OR WINDOW PANE REPLACED PRIOR TO FLIGHT.

(2) CRAZING DEFECTS CAN ADVANCE AT A RAPID RATE. IT IS RECOMMENDED THAT DEFECTS GREATER THAN 0.005 INCH IN DEPTH BE REPAIRED BEFORE MAXIMUM ALLOWABLE DEFFECT DEPTH IS REACHED.

FOR AREA A, WINDOW PANE THICKNESS AFTER REPAIR MUST NOT BE LESS THAN 0.280 INCH FOR OUTER PANE OR 0.210 INCH FOR INNER PANE

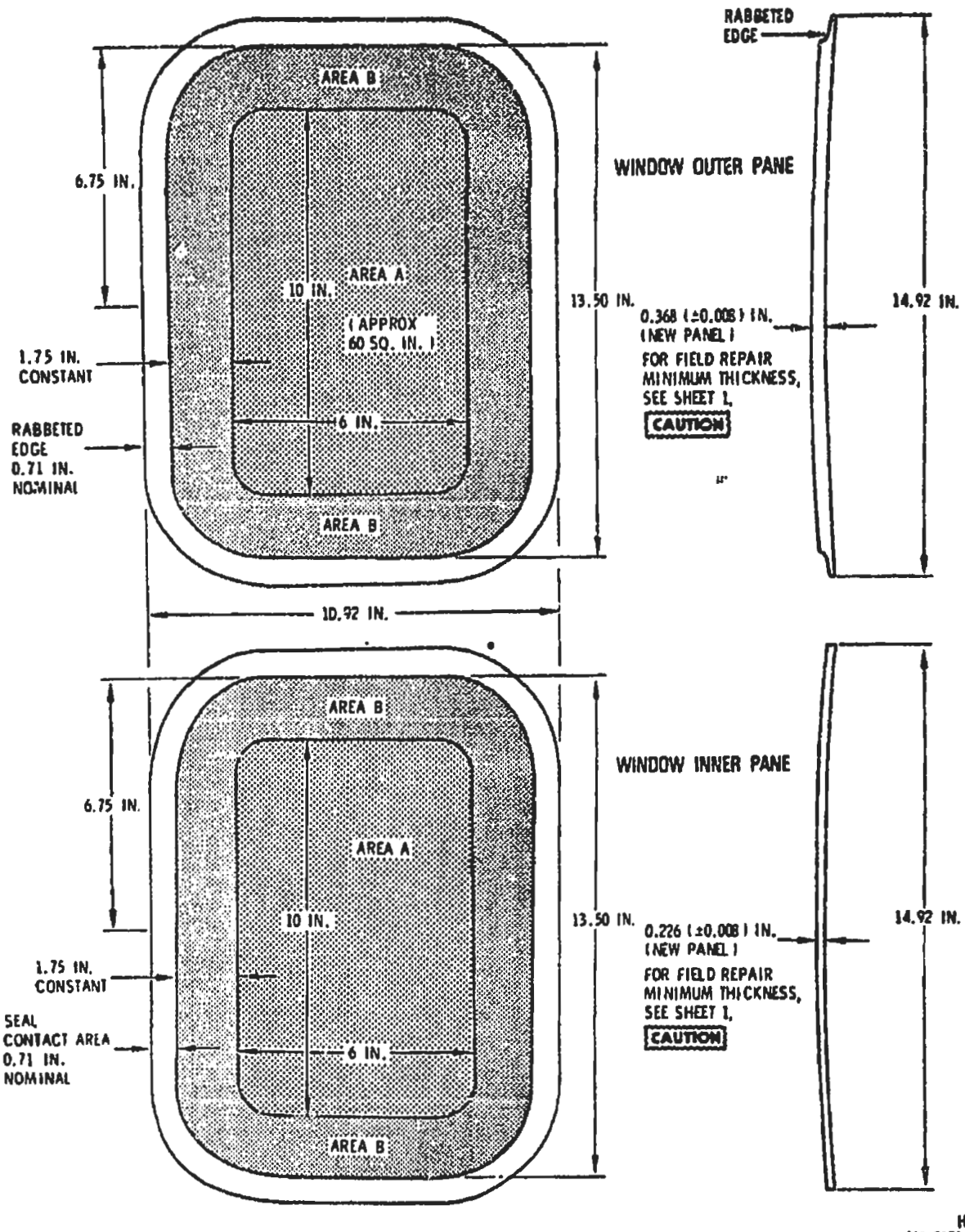
FOR AREA B, WINDOW PANE THICKNESS AFTER REPAIR MUST NOT BE LESS THAN 0.280 INCH FOR OUTER PANE, OR 0.190 INCH FOR INNER PANE (REF. 56-21-01 APPROVED REPAIRS).

REPAIRS ARE NOT PERMITTED ON RABBETED EDGE OF OUTER PANE EXCEPT AS SHOWN IN FIGURE 802 OR SEAL CONTACT AREA OF INNER PANE. REMOVE AND REPLACE INNER OR OUTER PANE AS APPLICABLE.

M1-0006-56-008

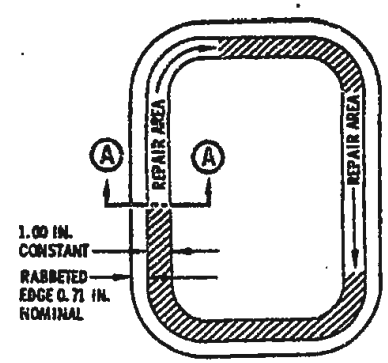
R
R

Window Repair Criteria
Figure 801 (Sheet 1)

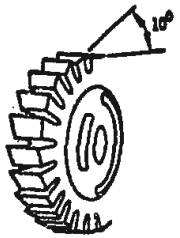


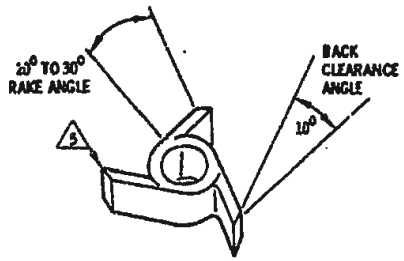
HH 4430
M1-0101-56-007

Window Repair Criteria
Figure 801 (Sheet 2)

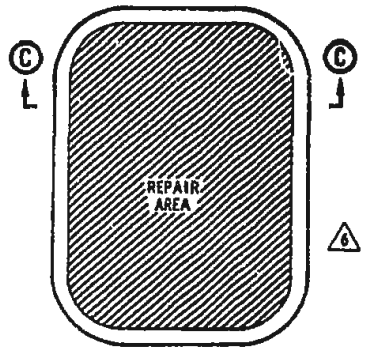


WINDOW OUTER PANE EDGE REPAIR



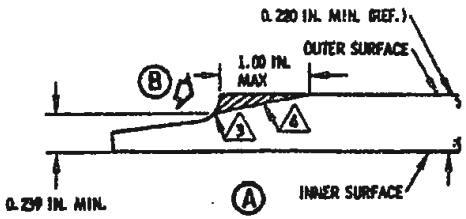


TYPICAL CUTTERS FOR ROUTERS FOR METHOD 1 APPROVED REPAIRS

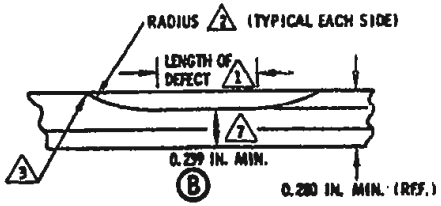


6 METHOD 2 APPROVED REPAIR

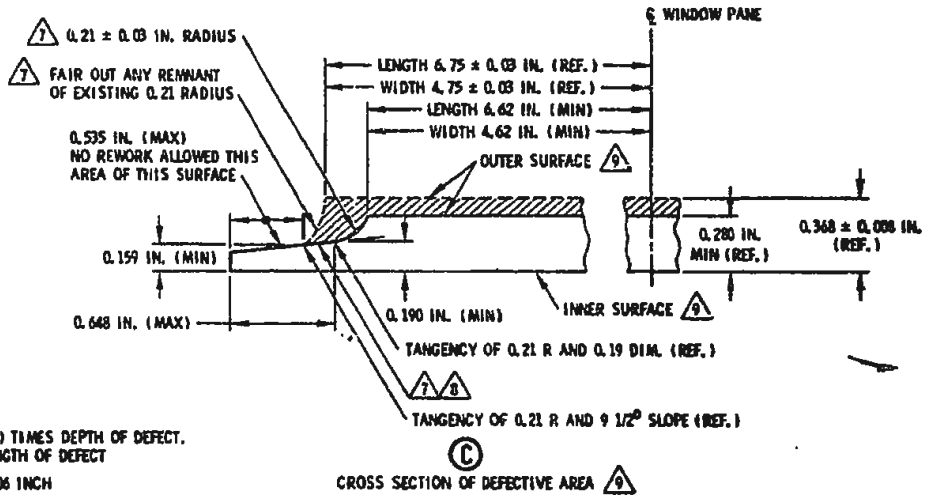
WINDOW OUTER PANE REPAIR



CROSS SECTION OF DEFECTIVE AREA



EDGE VIEW OF DEFECTIVE AREA METHOD 1 APPROVED REPAIR


7 0.21 ± 0.03 IN. RADIUS
7 FAIR OUT ANY REMNANT OF EXISTING 0.21 RADIUS
0.535 IN. (MAX) NO REWORK ALLOWED THIS AREA OF THIS SURFACE
℄ WINDOW PANE
LENGTH 6.75 ± 0.03 IN. (REF.)
WIDTH 4.75 ± 0.03 IN. (REF.)
LENGTH 6.62 IN. (MIN)
WIDTH 4.62 IN. (MIN)
OUTER SURFACE 9
0.159 IN. (MIN)
0.280 IN. MIN (REF.)
0.368 ± 0.008 IN. (REF.)
0.648 IN. (MAX)
0.190 IN. (MIN)
INNER SURFACE 9
TANGENCY OF 0.21 R AND 0.19 DIM. (REF.)
7 8
TANGENCY OF 0.21 R AND 9 1/2° SLOPE (REF.)
C

CROSS SECTION OF DEFECTIVE AREA 9

NOTE

1. LENGTH OF EDGE DEFECT IS UNLIMITED
2. MINIMUM RADIUS EACH SIDE IS EIGHT (8) TIMES DEPTH OF DEFECT. MINIMUM RADIUS IS EIGHT (8) TIMES LENGTH OF DEFECT
3. POLISH OUT CORNERS TO A RADIUS OF 0.06 INCH
4. FOR ANY DEFECT WITHIN 1.00 INCH WIDE AREA, DEPTH OF REPAIR MUST NOT EXTEND BELOW STRAIGHT SLOPING LINE
5. CORNERS OF ROUTING CUTTERS MAY BE GROUND FOR RADIUS AS REQUIRED
6. THIS REPAIR TO BE UTILIZED FOR THE ENTIRE OUTER SURFACE OF THE WINDOW PANE
7. FINISH SHALL BE 125 RMS (MAX) THIS AREA
8. STRAIGHT LINE TRANSITION WHEN LENGTH OR WIDTH OF OUTER SURFACE AREA AND PANE THICKNESS HAVE BEEN REWORKED TO THE MINIMUM DIMENSIONS SHOWN
9. REMOVE MINIMUM AMOUNT OF MATERIAL REQUIRED TO ACCOMPLISH REPAIR

M1-0004-56-025

R
R
Outer Passenger Cabin Window Repair
Figure 802

EFFECTIVITY: ALL

001B

GALLEY COMPARTMENT WINDOW - REMOVAL AND INSTALLATION

1. Equipment and Materials

   Lock-wire, Fed Spec QQ-W-390, 0.032-inch diameter, or equivalent

   Workstand

2. Removal/Installation - Galley Compartment Window

   A. Removal

      (1) Remove screws from window retainer above work counter on left side of the galley compartment (Ref. Fig. 401).

      (2) Remove retainer, window pane, and seal.

R CAUTION: DO NOT LEAN ON HARNESSES AND DUCTS.

      (3) Remove tunnel shroud with bulb seal to gain access to window.

      (4) Remove retainer clips from top and bottom window frame by compressing spring steel retainer clip and disengaging rivet from holes. Protect window pane to prevent scratches during disengagement.

      (5) Remove screw-on retainers.

      (6) Remove retainer ring.

      (7) Remove transparent assembly as a unit (seal and two window panes).

   B. Installation

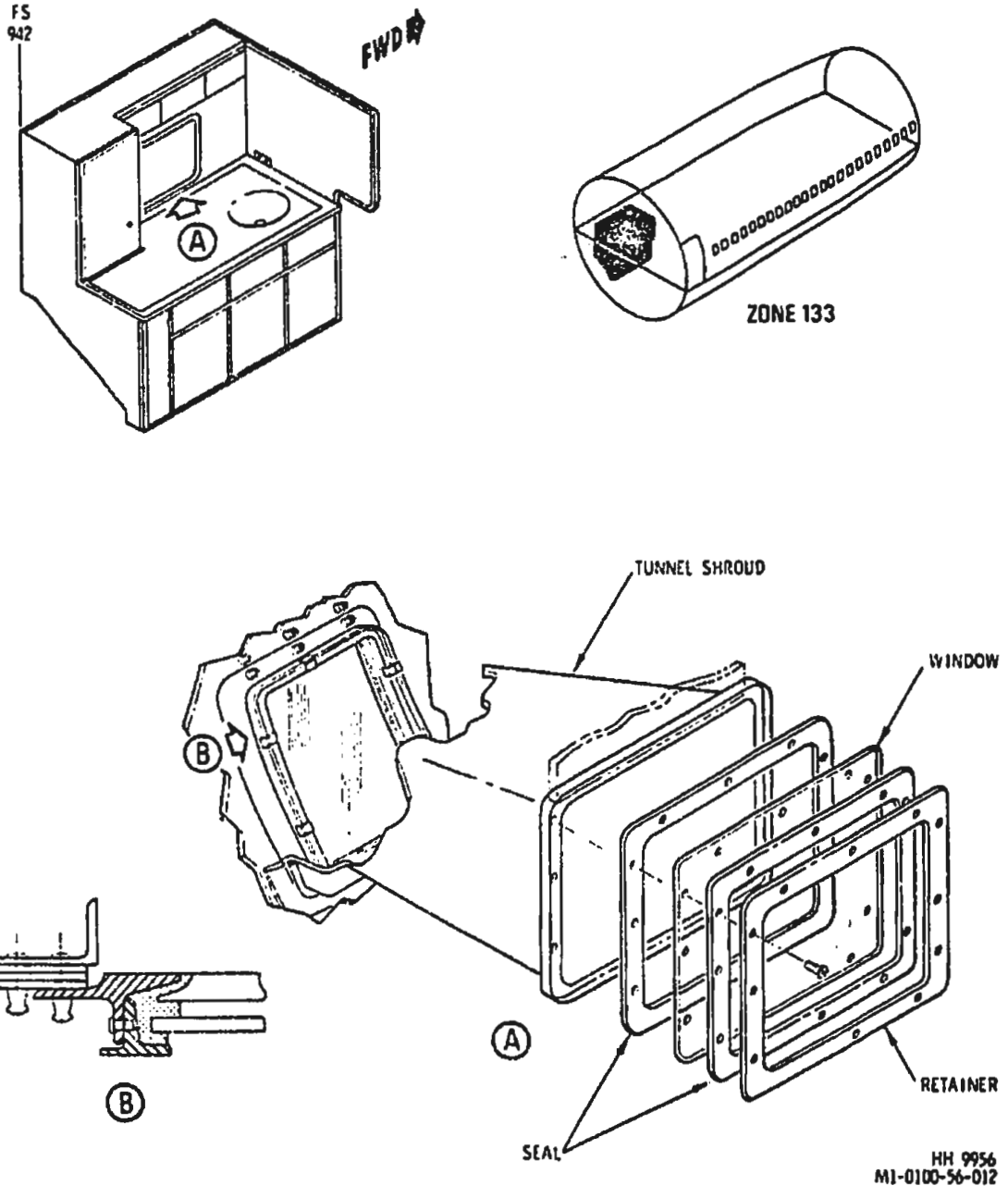
      (1) Check window panes and sealing surfaces for cleanness and serviceability.

R CAUTION: DO NOT LEAN ON HARNESSES OR DUCTS.

      (2) Position transparent assembly with inner pane vent hole up.

      (3) Position window retainer ring on inboard face of window seal.

      (4) Install spring steel retainer clip on top and bottom window frame, while maintaining the centered-window



R Galley Compartment Window - Removal and Installation
R Figure 401

R EFFECTIVITY: ALL
R
050B

R position. Check that retainer clip rivets are inserted
R in window frame holes.

R (5) Install screw-on retainers and lock-wire.

R (6) Replace tunnel shroud and engage bulb seals with sides
R of window frame.

R (7) Position seal, window pane, and retainer.

R (8) Install screws.

R 4. Removal/Installation - Galley Window Extension in MLG Fairing

R A. Removal

R (1) Position workstand to reach fairing window.

R (2) Remove screws from window assembly.

R (3) Remove retainer, window, and gaskets (Ref. Fig. 402).

R B. Installation

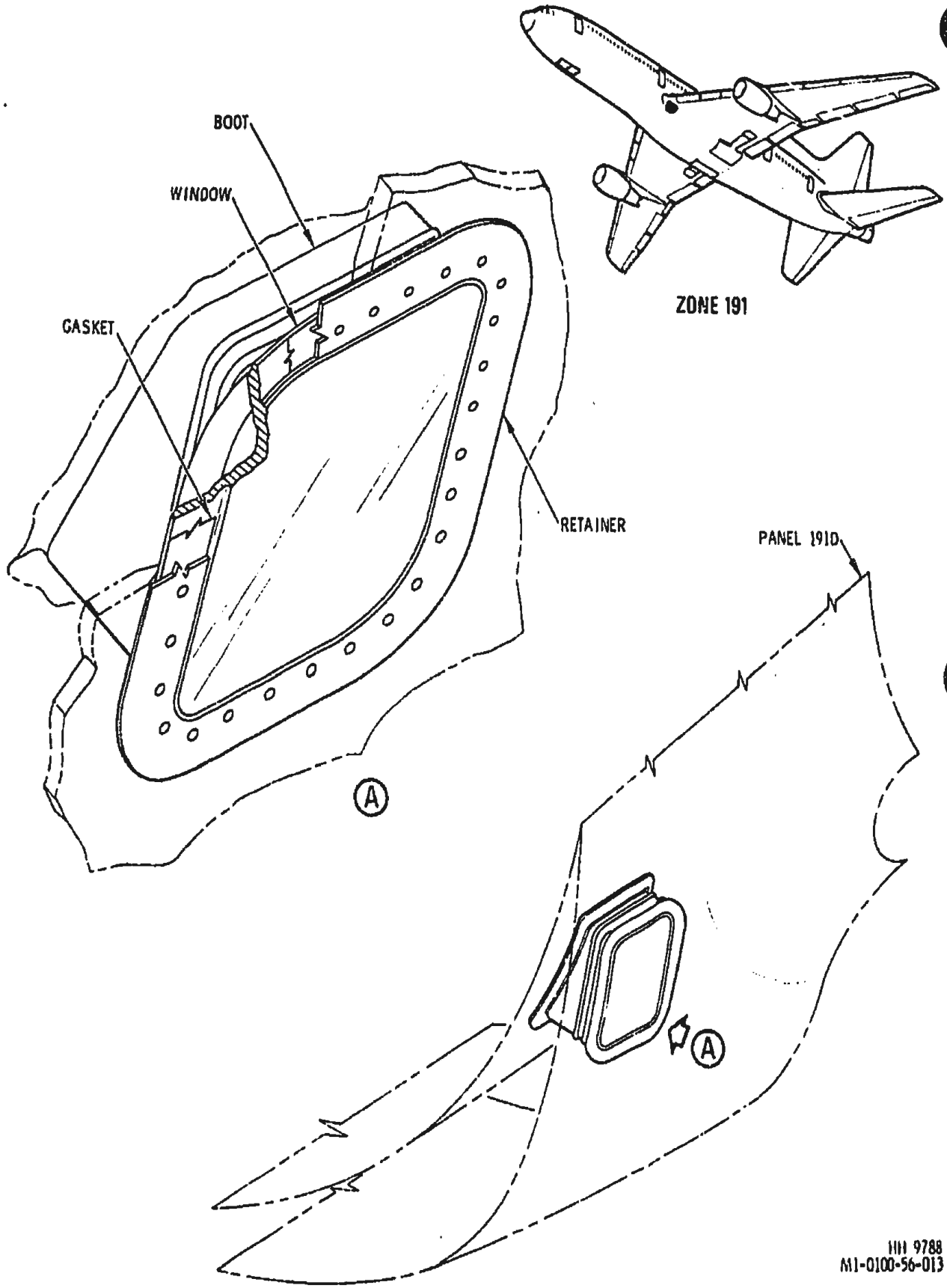
R (1) Check boot, and position inboard side of boot around
R external flanges of galley compartment window.

R (2) Line up holes of outside boot flange with holes in
R fairing.

R (3) Position window pane, gasket, and retainer.

R (4) Install screws.

R (5) Remove and stow workstand.



Galley Window Extension-MLG Fairing - Removal and Installation
Figure 402

R # PASSENGER COMPARTMENT WINDOWS - CLEANING

R 1. General

R The passenger compartment windows must be cleaned internally and
R externally to maintain optical quality.

R CAUTION: ALWAYS REMOVE DUST, DIRT, GRIME, AND LIME BY FLUSHING
R WITH CLEAN WATER, IF POSSIBLE, OR BY BLOWING WITH
R CLEAN, COMPRESSED AIR BEFORE APPLYING CLEANING FLUID,
R CLEANING COMPOUND, OR PROTECTIVE COMPOUNDS.

R DO NOT USE THE FOLLOWING MATERIALS ON ACRYLIC
R PLASTICS: GASOLINE, ALCOHOL, BENZINE, HEXANE, ZYLENE,
R ACETONE, CARBON TETRACHLORIDE, FIRE EXTINGUISHER OR
R DEICING FLUIDS, LACQUER THINNERS, OR WINDOW CLEANING
R SPRAYS BECAUSE THEY SOFTEN THE PLASTIC AND/OR CAUSE
R CRAZING.

R Waxing and polishing is required after cleaning. Combination
R compounds for cleaning and waxing are acceptable. Windshield
R waxing improves the optical quality. The thin film of wax can
R fill minute hairline scratches.

R 2. Equipment and Materials

R Cloth, soft, clean, and oil-free.

R Nonabrasive liquid household soap or detergent diluted in water.

R Aliphatic Naphtha, TT-N-95, TYPE II or equivalent Static-stop
R Cleaner Wax, or equivalent

R Permatex Plastic Cleaner, MIL-C-18767, MS-260 or equivalent.

R Dupont No. 7 Auto Polish and Cleaner, (Johnson's Pride), or
R equivalent.

R 3. Cleaning

R A. Remove loosely adhering dirt and grit from cabin windows by
R flushing with clean water.

R B. Wipe with a soft, cotton flannel, damp cloth. Keep cloth
R free of abrasive materials by rinsing it frequently in clean
R water.

R C. Wash with nonabrasive soap and water. Use a soft, cotton
R flannel, cloth to flush and float away dirt particles.

R CAUTION: ALL RUBBING OPERATIONS ON ACRYLIC PLASTICS MUST BE
R DONE WITH AS LIGHT A PRESSURE AS POSSIBLE.

R D. Dry cabin windows with a clean, damp cotton flannel cloth.
R Do not rub plastic after surface is dry.

R WARNING: ALIPHATIC NAPHTHA IS FLAMMABLE AND TOXIC.

R CAUTION: DO NOT RUB DRY PLASTIC WITH A DRY CLOTH. THIS
R WILL CAUSE SCRATCHES AND BUILD UP AN ELECTROSTATIC
R CHARGE WHICH ATTRACTS DUST PARTICLES.

R E. Remove remaining specks or smudges by rubbing lightly with a
R cloth wetted with aliphatic naphtha, or equivalent. Dry
R with a clean, cotton-flannel cloth.

R 4. Cabin Window Waxing

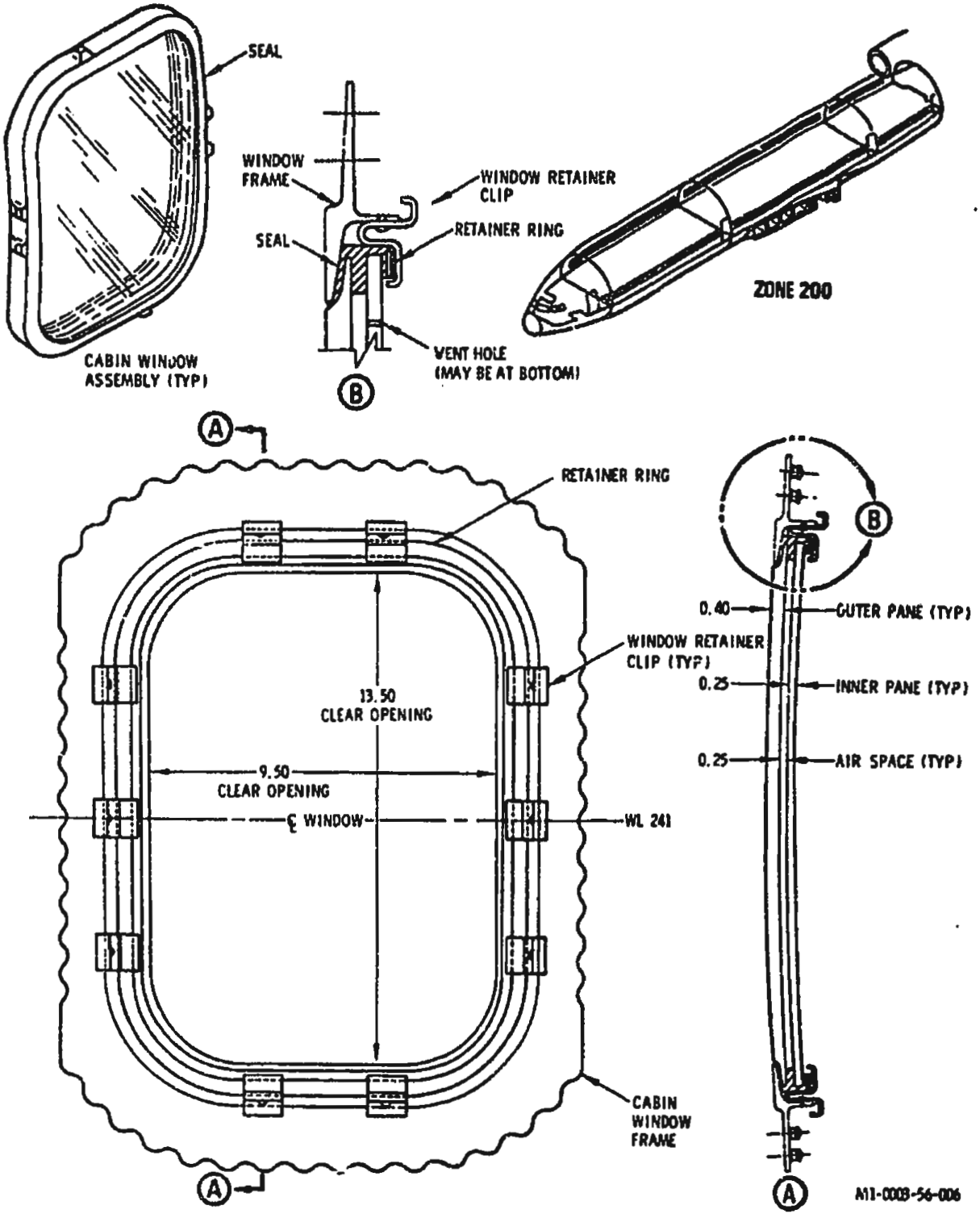
R A. Mix cleaning or waxing compound to ensure a homogeneous
R mixture.

R B. Apply cleaning compound or wax with clean, soft cloth. Use
R very light pressure and eliminate accumulation of grit on
R cloth while cleaning. For minute scratches, work at right
R angle to scratches for best blending action.

R C. Reapply cleaner-polisher as necessary. Wipe off cleaner and
R polish with a clean, soft cloth.

R D. Polish to a high luster by light polishing with a clean
R cotton flannel cloth. Polishing may be done before or after
R cleaning compound or wax has dried.

R E. Remove any streaks or fingerprints from waxed acrylic
R surface by polishing lightly with a clean cotton flannel
R cloth. If appearance is unsatisfactory, reapply cleaning
R compound or wax in accordance with above procedure.



R Passenger Compartment Windows
R Figure 701

EFFECTIVITY: ALL

001B

DOOR WINDOWS - DESCRIPTION AND OPERATION

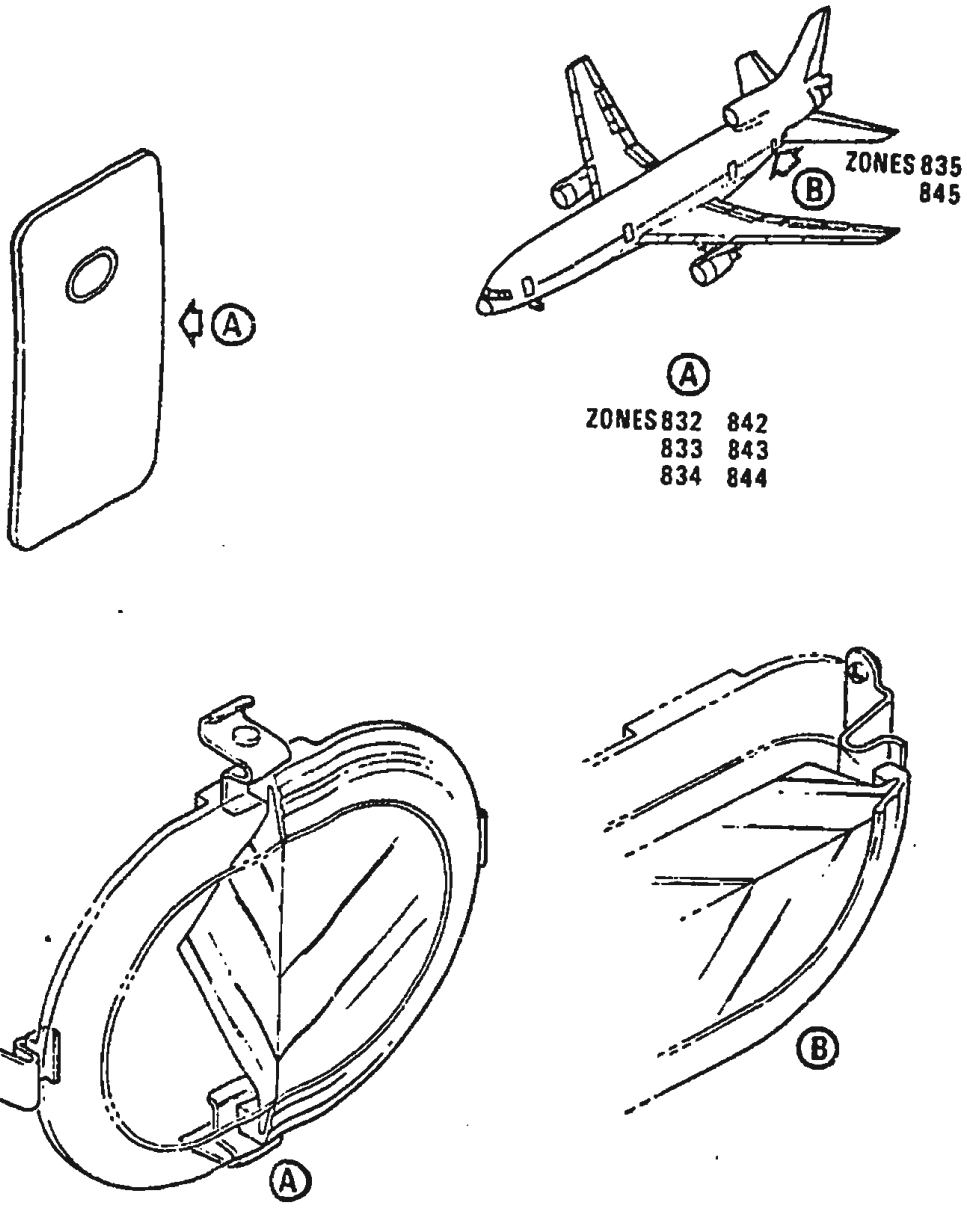
1. General

All passenger compartment doors have oval-shaped prism windows approximately 5 inches high and 7 inches wide (Ref. Fig. 1).

The prism window deflects view angle downwards 30 degrees for observation of ground below a door before door release for
R passenger emergency use. An acrylic prism is installed in a silicone rubber seal and held by snap-in steel clips, similar to those for the cabin window installation.

R The prism window of L4 and R4 door is held in place by screw-on aluminum clips.

The galley compartment door has a dual pane window of standard cabin size. The window is retained by screw-on clips or snap-in
R steel clips to satisfy installation requirements for windows
R below passenger compartment floor (ditching requirement).



HH 9006
MI-0100-56-010

R
R Window, Passenger Door
Figure 1

R EFFECTIVITY: ALL
R
050B

DOOR WINDOWS, PASSENGER COMPARTMENT - REMOVAL AND INSTALLATION

1. General

All windows in passenger compartment doors are single-pane prism-windows which are retained by spring-steel retainer clips. Pane is retained by a combination of screw-on aluminum clips and spring-steel retainer clips (Ref. Fig. 401).

2. Referenced Procedures

R	25-61-10	Evacuation Slide/Raft Assembly - Removal and Installation
	52-13-01	Door Lining, Passenger Doors - Removal and Installation
	52-24-01	Door Lining, L4 and R4 Door - Removal and Installation

3. Removal/Installation - Passenger Compartment Door Windows

A. Removal

R R (1) Remove slide/raft assembly and door lining (Ref. 25-61-10 and 52-13-01).

(2) Remove spring-steel retainer clips by compressing to disengage rivet from hole (Ref. Fig. 401).

(3) Remove seal and prism window.

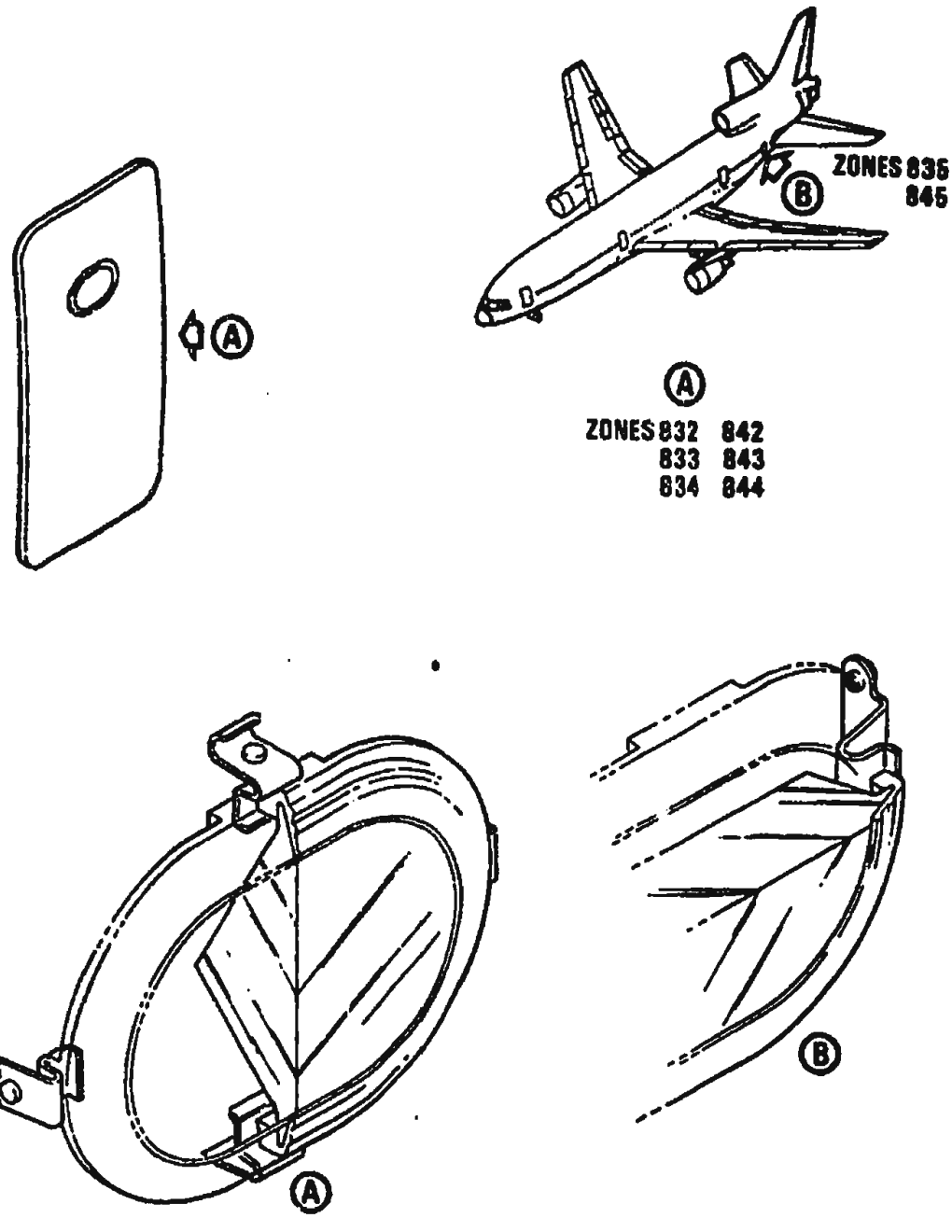
B. Installation

(1) Check prism window, seal, and seal contact area for condition.

(2) Position prism-window and seal with tapered side of prism-window in the upper position so that the angle-of-vision is deflected downwards.

(3) Install spring-steel retainer clips (Ref. Fig. 401, View A.) Install flanged clip in bottom position.

(4) Check that spring-steel retainer clip rivets are fully engaged in hole under a slight preload on seal retainer.



HH 9076
M1-0100-56-010

Passenger Door Window
Figure 401

R (5) Install door lining and slide/raft assembly (Ref.
R 52-13-01 and 25-61-10).

4. Removal/Installation - L4 and R4 Emergency Door Window

A. Removal

R (1) Remove slide/raft assembly and door lining (Ref.
R 25-61-10 and 52-24-01).

(2) Remove spring-steel retainer clips at top and bottom. Compress clip to disengage rivet from hole.

(3) Remove screw-on clips on sides of window frame (Ref. Fig. 401, View B).

(4) Remove seal and prism-window.

B. Installation

(1) Check prism-window, seal, and seal contact area for condition.

(2) Position prism-window and seal with tapered side of prism-window in the upper position so that the angle-of-vision is deflected downwards.

(3) Center prism-window and seal, and install spring-steel retainer clips at the upper and lower positions.

(4) Install screw-on retainer clips at both sides of window.

(5) Check that rivets of spring steel retainer clips are fully engaged, and that all clips have a slight preload against the prism-window seal.

R (6) Install door lining and slide/raft assembly (Ref.
R 52-24-01 and 25-61-10).

DOOR WINDOWS, PASSENGER COMPARTMENT - INSPECTION AND CHECK

1. General

This procedure is applicable for the eight prism-type door windows in the passenger compartment.

The prism type windows have thickness and strength that greatly exceed operating requirements. Therefore, specific limitations are not established for surface defects which develop or occur during normal service operation.

2. Referenced Procedures

56-31-01	Door Windows, Passenger Compartment - Removal and Installation
56-31-01	Door Windows, Passenger Compartment - Approved Repairs

3. Inspection/Check

A. Inspection

NOTE: Surface defects (scratches, crazing and chips/gouges) are not limited in depth or area covered. If surface defects become numerous and severe enough to result in unacceptable vision or appearance, the window may
CR be repaired or replaced. The airplane may continue a
CR flight or series of flights but may not depart the
CR station designated by MCIMD without being repaired or
CR replaced.

(1) Inspect surface defects (scratches, crazing and chips/gouges) for effects on visibility and appearance.

(2) If window is repaired, refer to 56-31-01, 801.

(3) If window is replaced, refer to 56-31-01, 401.

DOOR WINDOWS, PASSENGER COMPARTMENT - APPROVED REPAIRS

1. General

This procedure is applicable for the eight prism type door windows in the passenger compartment.

The prism type windows have thickness and strength that greatly exceed operating requirements. Therefore, specific limitations are not established for surface defects which develop or occur during normal service operation. Normally, the usual types of defects (scratches, crazing, chips/gouges) will adversely affect the visual qualities of the window and produce an unacceptable appearance before a structural problem arises.

Therefore, the window may be repaired if acceptable optically, and weather and pressure sealing is maintained. In case a repair is deemed practical, the procedure for repairing the
R passenger compartment windows may be used with the exceptions
R noted on Figure 801.

2. Referenced Procedure

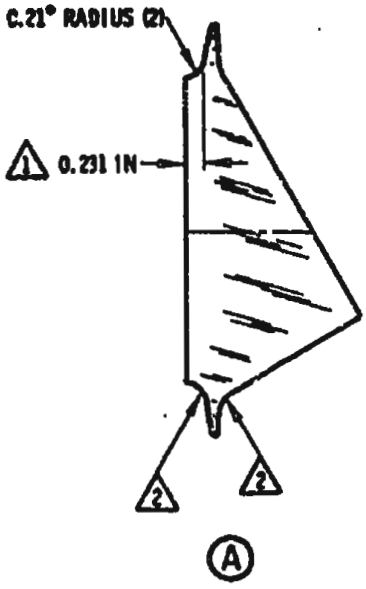
56-21-01 Passenger Compartment Windows - Approved Repairs

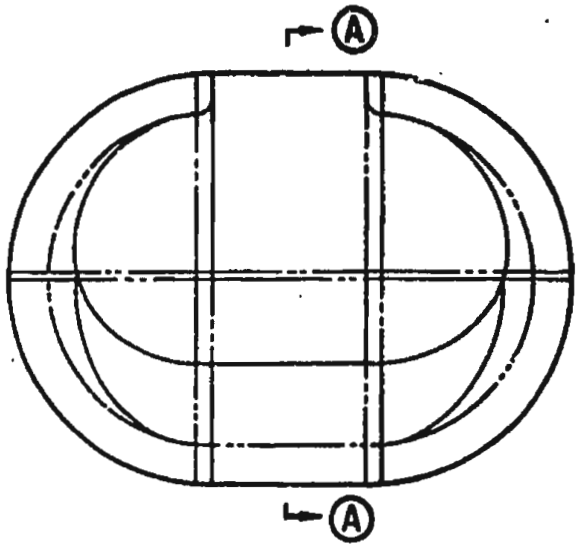
3. Approved Repairs

A. Repair

(1) Repair window, using materials and basic procedures, as applicable, specified in 56-21-01.

NOTE: The defect limitations specified in 56-21-01 are not directly applicable to the prism type windows. However, if defects of greater depth are removed, it is possible that the optical qualities will be unacceptable. In such cases, the window must be replaced.





PASSENGER DOOR PRISM WINDOW

NOTE

1. 0.080 MINIMUM AFTER REWORK
2. NO REWORK ALLOWED ON FLANGE SURFACES (ENTIRE PERIPHERY)

M1-0000-56-037

R Passenger Door Prism Window - Approved Repair
R Figure 801

GALLEY DOOR WINDOW - REMOVAL AND INSTALLATION

1. General

The galley door window is of the same size and material as the passenger compartment windows. The transparent assembly is attached with spring steel retainer clips and extruded clips which are attached with screws.

2. Referenced Procedure

52-41-05 Galley Door Trim Panel - Removal and Installation

3. Removal/Installation

A. Removal

(1) Remove door trim panel (Ref. 52-41-05) and gain access to transparent assembly.

(2) Remove extruded clips.

(3) Remove retainer ring.

(4) Remove transparent assembly (seal and dual window panes).

B. Installation

(1) Check window panes, seal, and seal contact area on window frame for condition and cleanness.

(2) Install window transparent assembly with inner pane vent hole up.

(3) Position window retainer ring on inboard face of seal and center transparent assembly in window frame.

(4) Install extruded clips.

(5) Check that all extruded clips depress the retaining ring pads for equal and adequate preload.

(6) Install door trim panel (Ref. 52-41-05).

INSPECTION AND OBSERVATION - DESCRIPTION AND OPERATION

1. General

Optical viewers and windows are provided for visual observations and inspection.

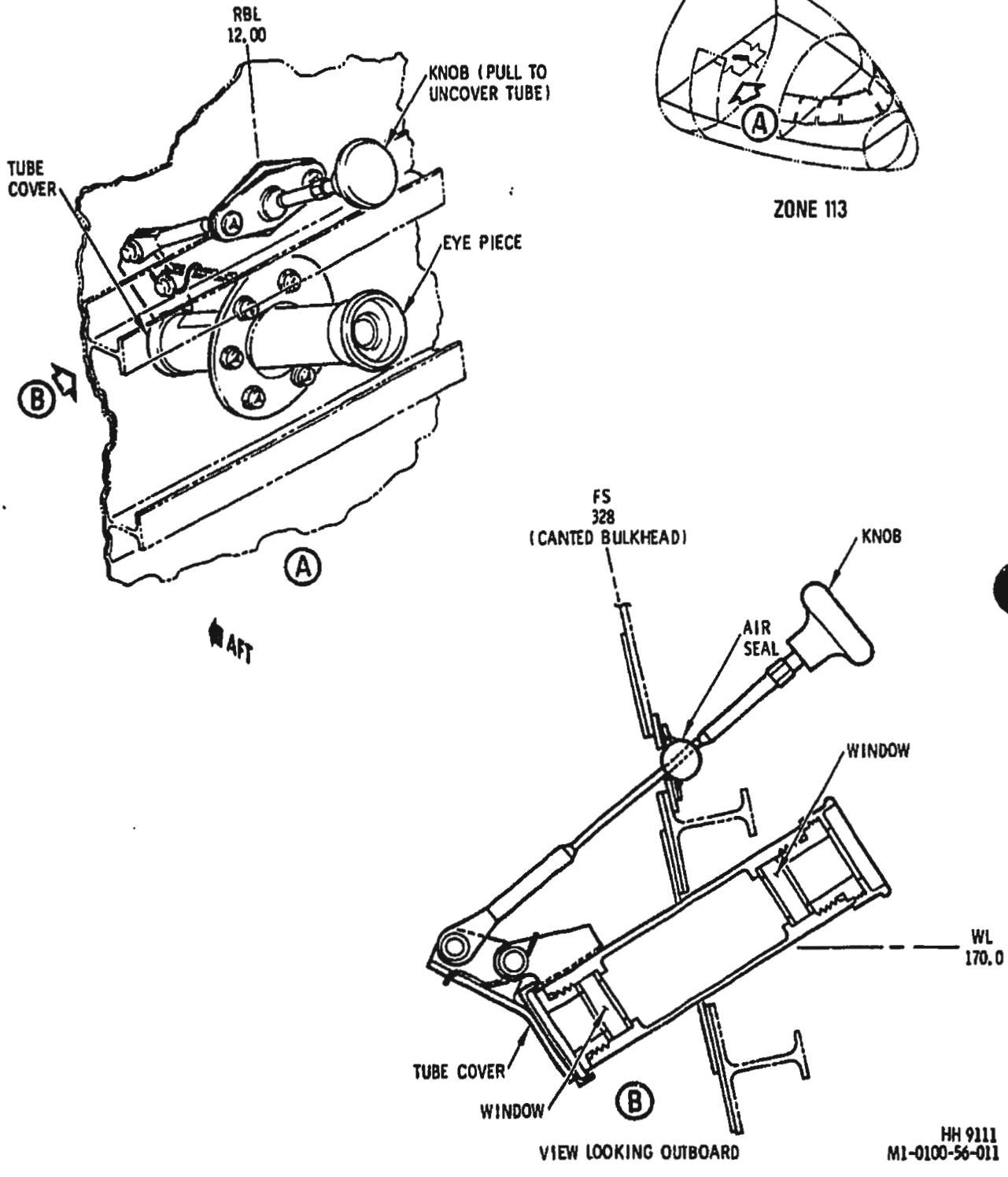
A. Inspection Tube for Nose Landing Gear (NLG) Locking

An inspection tube is installed in the canted bulkhead at FS 328 in the forward electronic servicee center, zone 113. Access to this inspection tube is from the flight station through floor panel 211CB (Ref. Fig. 1).

The inspection tube is pressure tight and has a hinged dirt cover on the side of the NLG well. The cover is lifted by pulling a knob a few inches above the eyepiece. The nonmagnifying inspection tube is installed to view the mechanical downlock indicator on the NLG jury brace. Light in the NLG wheel well illuminates the indicator (Ref. 32-61-00).

B. Flight Station Door Viewer and Window

A wide-angle lens viewer is installed in the flight station door below the door window (Ref. 52-51-00). This viewer is used for all-around observation of the flight station entrance without opening the door or uncovering the door window.



Inspection Tube, Nose Landing Gear Downlock
Figure 1